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Tachyini (Coleoptera, Carabidae) of North Korea

[Pp. 155—196, 95 text-figs.]

Tachyini (Coleoptera, Carabidae) Północnej Korei

Tachyini (Coleoptera, Carabidae) Северной Кореи

Abstract: The review of the *Tachyini* material collected by 5 Polish zoological expeditions to Korean People's Democratic Republic in the years 1959—1971 is given*. Among 168 specimens 13 species were found, 4 of them being new to science. They are: *Tachys (Eotachys) dzosonicus* sp. n., *T. (E.) varsavianorum* sp. n., *T. (s. str.) gyotokuensis sohei* ssp. n., and *T. (s. str.) koreanorum* sp. n. From the remaining species 6 are new to the Korean peninsula. *Lymnastis yanoi* NAK. and an oriental *Tachys (s. str.) quadrillum* SCHAUM reaching their northern line of distribution here. The paper is supplemented with a key to the determination of Korean *Tachyini* and with ecological and zoogeographical remarks. In consequence of a revision of museum materials and a comparison with the collected material the author proposes the recognition of the names: *Tachys chinensis* JEDL., *T. coreanus* JEDL., and *T. goetzi* JEDL. as synonymes of species *T. (Tachyura) gradatus* BAT.

Up to the last years the *Tachyini* fauna of the Korean peninsula was only known from single specimens of the representatives of 3 species. In the literature the first report dates from the between- the-Wars period. It was a description of "*Tachys coreanus*" (an aberrative form of *T. gradatus* BAT.) made by JEDLIČKA (1932) on the basis of one female from Vönsan ("Gensan"). In the list of Korean Carabides YANO (1941) reports the same species from Seul ("Keijo") and also two other species: *T. exaratus* BAT. and *Tachyta nana* (GYLL.) from the Hamgjong-

* The material of *Tachyini* collected during the 6th Polish Zoological Expedition to the North Korea (May-June, 1974) will be elaborated in next years.

sanmek Mountains ("Fusen-Valley", "Mt. Baji"). These data did not reach JEDLIČKA in whose monograph (1965a) still only one species appears from the peninsula. However, in the same year JEDLIČKA (1965b) describes "*Tachys goetzi*" from Čhŏngdžin ("Seishin"), also on the basis of one female, the description suggesting (I have not checked the type) that this is another aberrative form of *T. gradatus* BAT.

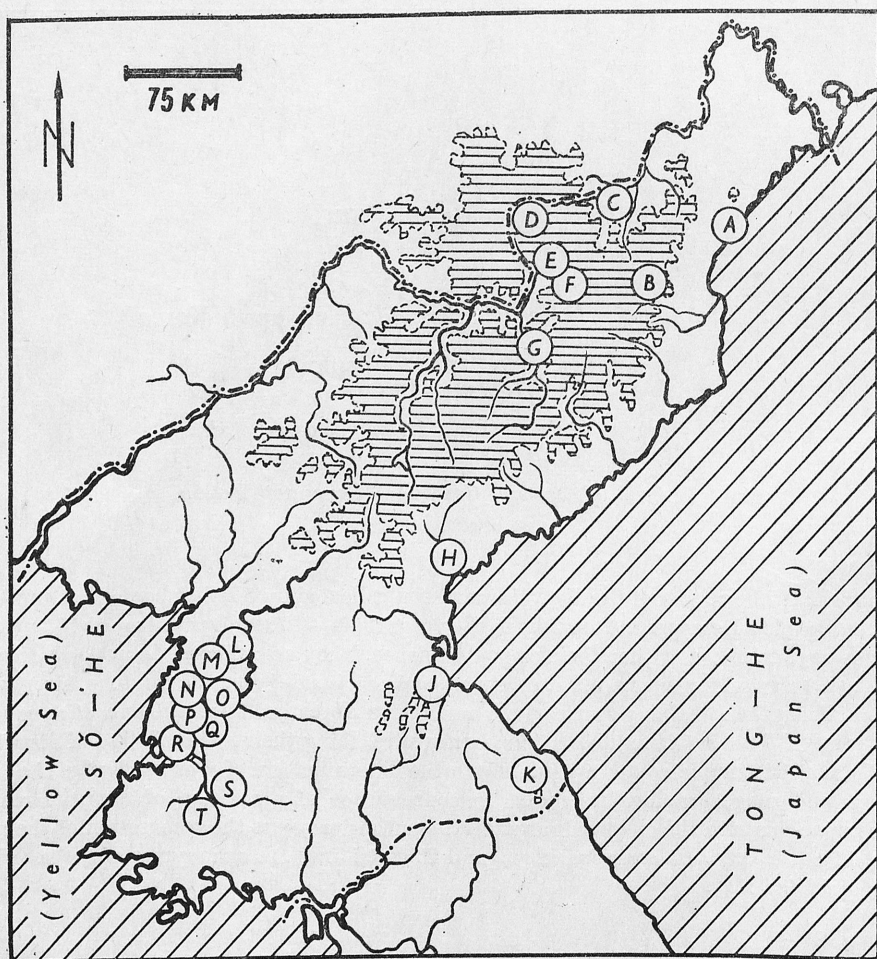


Fig. 1. Situation of known localities of *Tachyini* in North Korea (explanation of letters in the text — p. 157; territories above 1000 m a.s.l. thickly hatched)

In the present paper I used above all the materials collected by 5 Polish zoological expeditions to Korean People's Democratic Republic. They comprise 168 *Tachyini* specimens of 13 species. The majority of the materials (100 ex.) was collected by the present author himself during the fifth ("Cracow") expedition. In the work I also included 3 Korean specimens of *T. gradatus* BAT. from JEDLIČKA's collection, the property of the Entomology Section of the National Museum at Prague-Kunratice. The materials deposited in the Institute of Zoology of the

Polish Academy of Sciences in Warsaw are denoted by the abbreviation "IZW" in the text, the materials from the collection of the Institute of Systematic and Experimental Zoology of the Polish Academy of Sciences, with the abbreviation "ZZS", while the specimens from JEDLIČKA's collection with the abbreviation "MNP".

I give the transcription of geographical names of the majority of stations according to MROCKOWSKI's work (1972) while the transcription of the stations from the Janggang-do province (where the first four expeditions have not got) I worked out on the basis of the local Korean cartographic materials.

The investigated material comes from following localities (letters in square brackets indicate the localities on the map, fig. 1, and therefore they are placed at the lists of stations of separate species):

- [A] Čhǒngdžin, the main town of the province Čhǒngdžin-si.
- [B] Hamgjǒng-sanmek mountain chain, province Hamgjǒng-punkto.
- [C] The valley of the River Tuman-gang at the state line of the Chinese People's Republic, about 5 km north-east from Hǒngam, province Janggang-do, district Hǒngam.
- [D] Mountain Pektu-san on the state line of the Chinese People's Republic and its north-east foot; prov. Janggang-do, distr. Samdžijǒn.
- [E] The valley of the River Phote-čhǒn, 13 km. south from Samdžijǒn, prov. Janggang-do, distr. Samdžijǒn. Vicinity of a village Posǒ-ri, about 30 km south from Hjesan; prov. Janggang-do, distr. Počhǒn.
- [F] The valley of the River Karim-čhǒn, 5 km south from Počhǒnbo; prov. Janggang-do, distr. Počhǒn.
- [G] Vicinity of a village Dǒngha-ri, 15 km south from Hjesan; prov. Janggang-do, distr. Hjesan.
- [H] Hamhyng, the main town of the Hamhyng-si prov.
- [J] Vǒnsan, the main town of the province Kangvǒn-do.
- [K] Kymgang-san, a mountain chain in southern part of the province Kangvǒn-do.
- [L] Džamo-san hills and the vicinity of a village Džamo-ri, prov. Phjǒngan-namdo, distr. Sunčhǒn.
- [M] Sǒkam-Čǒsudži, a village and a lake; prov. Phjǒngan-namdo, distr. Sunan.
- [N] A village Junha-ri, 40 km west from Phjǒngjang; prov. Phjǒngan-namdo, distr. Sunan.
- [O] Phjǒngjang, the capital of Korean People's Democratic Republic. Locality Mankjǒngde; prov. Phjǒngjang-si.
- [P] A hill Jongak-san and a river-valley Sunha-gang, 16 km south-east from Phjǒngjang; prov. Phjǒngjang-si.
- [Q] Thesǒng, a locality and a lake; prov. Phjǒngan-namdo, distr. Kangsǒ.
- [R] Localities Usan-ri and Vaudo at the estuary of the River Tedong-gang; prov. Phjǒngan-namdo, distr. Nampho.
- [S] Sarivǒn, the main town of the province Hvanghe-pukto.
- [T] Sinčhǒn, a town in the province Hvanghe-namdo.

I should like to express here my gratitude to Docent Maciej MROCZKOWSKI from the Institute of Zoology of the Polish Academy of Sciences in Warsaw for entrusting me with the materials collected by the earlier expeditions. I also wish to thank Docent Zdeněk MLYNÁŘ from Prague for making possible for me to study the comparative materials from A. JEDLIČKA's collection, and Dr. Shun-Ichi UÉNO and Dr. Kazuo TANAKA from Tokyo for delivering comparative specimens from Japan. I wish to express my special gratitude to the participants of the 5th expedition: Prof. Józef RAZOWSKI for making possible night catches with the use of UV lamps, and Dr. Andrzej SZEPTYCKI for his active share in catching *Tachyini*. I also thank Mr KIM-Jong-Sam for facilitating field investigations and the interpreter, ing. KU-Wan-Son, the workers of the Korean Academy of Sciences in Phjǽngjang.

Key to Korean *Tachyini*

1. Whole upper surface hairy (fig. 2) *Lymnastis yanoi* NAKANE.
- Except for setae upper surface naked 2.
2. Recurrent stria near outer margin of elytra; upper surface of elytra with distinct isodiametric microsculpture visible already at 40-fold magnification *Tachyta nana* (GYLL.).
- Recurrent stria more or less in mid-distance between suture and outer elytral margin; at 40-fold magnification microsculpture on elytral surface invisible 3.
3. On each elytra only one dorsal pore 4.
- On each elytra two dorsal pores 10.
4. Dorsal pore on anterior part of elytra (fig. 39) *Tachys (Elaphropus) latissimus* MOTSCH.
- Dorsal pore on posterior part of elytra 5.
5. Dorsal pore on 3. stria (figs. 24, 28, 33) 6.
- Dorsal pore on 4. stria (figs. 5, 10, 19) 8.
6. Elytrae two-coloured with distinct spots or longitudinal streaks; body length 2.6—2.9 mm *Tachys (s. str.) quadrillum* SCHAUM.
- Elytrae almost uni-coloured without distinct spots or streaks, body length less than 2.5 mm 7.
7. Posterior angles of prothorax acute, shoulders denticulate, base of anterior apical seta almost close at end of recurrent stria (fig. 28) *Tachys (s. str.) gyotokuensis sohei* ssp. n.
- Posterior angles of prothorax obtuse, shoulders undenticulate, base of anterior apical seta distinctly separated from end of recurrent stria (fig. 33) *Tachys (s. str.) koreanorum* sp. n.
8. Prothorax faintly transverse. (index 1.3—1.4), about 1.3 times broader than head (fig. 10) *Tachys (Eotachys) dzosonicus* sp. n.

- Prothorax transverse (index ± 1.5), about 1.4 times broader than head (figs. 5, 19) 9.
9. Posterior angles of prothorax obtuse (fig. 5)
. *Tachys (Eotachys) pallescens* BAT.
- Posterior angles of prothorax acute or right (fig. 19)
. *Tachys (Eotachys) varsavianorum* sp. n.
10. 8. elytral stria in form of distinctly interrupted depression in posterior one third of elytrae *Tachys (Elaphropus) zouhari* JEDL.
- 8. elytral stria in form of uninterrupted depression or only faintly interrupted 11.
11. 8. stria deep only in posterior part of elytrae, at middle very shallow and slightly interrupted; Elytrae with microsculpture well visible already at 60-fold-magnification *Tachys (Tachyura) exaratus* BAT.
- 8. elytral stria deep on its whole length; elytrae smooth without distinct microsculpture even at 100-fold magnification 12.
12. Elytral striae punctate or in form of depressions interrupted in short sectors (fig. 78); elytrae without spots
. *Tachys (Tachyura) fuscicauda* BAT.
- Elytral striae in form of uninterrupted unpunctate depressions, 3. stria entirely or partly obsolete (fig. 46); elytrae mostly with two spots, anterior and posterior spots rarely obsolete, exceptionally complete lack of spots
. *Tachys (Tachyura) gradatus* BAT.

LIST OF SPECIES

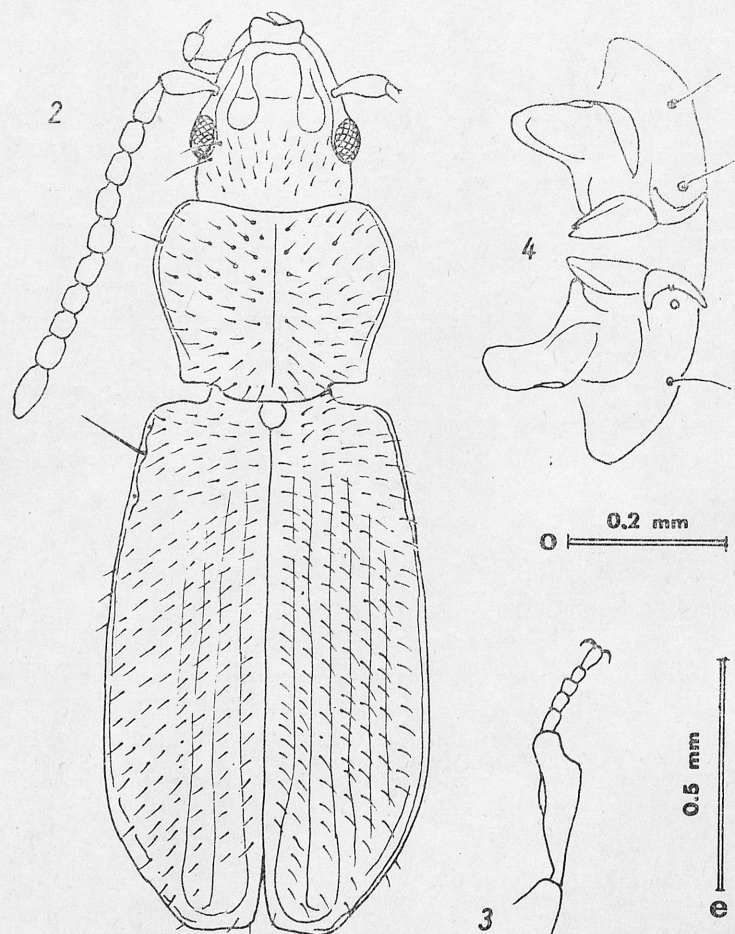
Lymnastis yanoi NAKANE, 1963

Limnastis pilosus yanoi NAKANE, 1963: 23 (Moriguchi, Osaka, Honshu); 1964: 25 (Honshu, Kyushu, Moriguchi). *Limnastis pilosus yanoi*: JEDLIČKA, 1965a: 192 (Japan: Moriguchi, Osaka, Honshu).

Material examined:

[Q] ThesŃng, on a sandy and stony beach at an artificial water body, 24 VIII 1971, 1 ♀ leg.
J. PAWŁOWSKI (ZZS).

The specimen was compared with description of the holotype presented by NAKANE (1963). The details of the morphological structure of the Korean specimens and the shape of hemisternum are presented in figs. 2—4. NAKANE (1963) and after him JEDLIČKA (1965a) regarded the discussed taxon as a sub-species of an oriental *L. pilosus* BAT. which inhabits the sea-coasts of a large area from north Australia to Taiwan and from Burma to Philippines. However, the morphological structure (especially the proportions of prothorax which is strongly transverse in *L. pilosus* BAT.) as well as the size of the beetle (according to ANDREWES, 1925, *L. pilosus* BAT. is 2.2 mm long, thus it is much larger), distinctly separate the two



Figs. 2—4. *Lymnastis yanoi* NAK., specimen from Thesöng: 2 — habitus, 3 — right foreleg, 4 — hemisterna (2, 3 — magnification “e”; 4 — magnification “o”

Table I

Some differences between *Lymnastis pilosus* BAT. and *L. yanoi* NAK.

	<i>L. pilosus</i> BAT.	<i>L. yanoi</i> NAK.
body length (mm)	1.9 — 2.2*	1.7** — 1.8***
index of pronotum	1.28 — 1.32*	1.24***
width proportion head: pronotum	0.64 — 0.66*	0.70***
elytrae: pronotum	1.41 — 1.45*	1.37***

* after DARLINGTON (1962)
** after NAKANE (1963)
*** Korean specimen

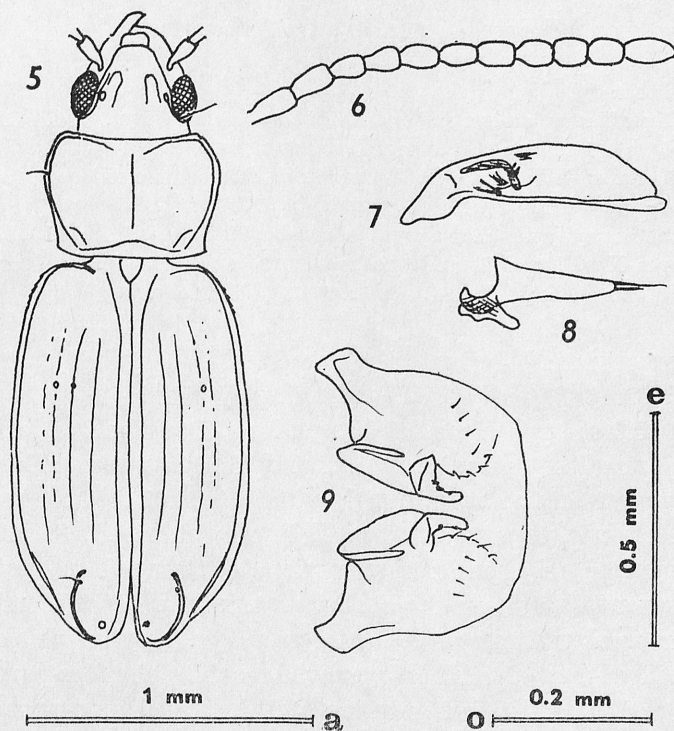
forms. Therefore I suggest that *L. yanoi* NAK. should be acknowledged as a separate species, probably of a Manchurian type of distribution. It is interesting that both in its size and shape of prothorax the discussed species is more similar to the Indo-Chinese *L. coomani* JEANN. The comparison of *Lymnastis yanoi* NAK. and *L. pilosus* BAT. is presented in Tab. I.

Tachys (Eotachys) pallescens BATES, 1873

Tachys pallescens BATES, 1873: 297. *Tachys pallescens*: ANDREWES, 1925: 353 (Japan); JEDLIČKA, 1965a: 168 (Japan; NO-China — "Mandschurei"); NAKANE & al., 1963: 25 (Honshu, Kyushu). Material examined:

[M] Sökam-Čösudži, on a beach at a lake, 20 VIII 1971, 1 ♂ and 1 ♀ under a mat on the sand leg. J. PAWŁOWSKI (ZZS).

The description of Korean specimens. Length of a male 2.00 mm, of a female 1.94 mm. Head brown, eyes brownish-black, joints of antennae from 3. to 11. darkened (only a little lighter at the head), remaining parts of the body dark testaceous. Isodiametric microsculpture, indistinct; stronger on the head than on prothorax; elytrae at 100-fold magnification almost smooth.



Figs. 5—9. *Tachys (Eotachys) pallescens* BAT. from Sökam-Čösudži: 5 — habitus of the female, 6 — its right antenna, 7 — aedeagus of the male, 8 — its left paramere, 9 — hemisterna of the female (5 — magnification "a"; 6 — magnification "e"; 7—9 — magnification "o")

Two first elytral striae continuous in form of depressions, 3. and 4. interrupted, 5. only marked, 6. and 7. obsolete decline, 8. impressed only on posterior one third of elytrae. Only one dorsal pore on the anterior one third of the length of elytrae, on 4. stria. At the shoulder the elytral margin covered with delicate setulae not visible but at 100-fold magnification. Recurrent stria weakly curved, base of anterior apical seta almost close to recurrent stria. In male only the first joint of pro-tarsi dilated.

In relation to ANDREWES'S (1925) re-description the above description is somewhat different. According to the above-mentioned author "front dorsal pore at about a third, occupying the whole of interval 4", while JEDLIČKA'S opinion (1965a) is similar to mine: "Vorderer Dorsalpunkt liegt am 4. Streifen (wenn im 4. Zwischenraum, dann näher dem 4. Streifen als dem dritten)". The discrepancy also concerns the microsculpture of elytrae which was evaluated by ANDREWES as similarly strong as that on the prothorax ("the meshes very wide on the elytra and prothorax"). These differences are unimportant since they depend both on the light and optical facilities and on the interpretation. However, the descriptions of the outline (compare figs. 5 and 6) and colour are basically the same. I present the genital organ of male and hemisternum of female of Korean specimens on figs. 7—9.

Tachys (Eotachys) dzosonicus sp. n.

Material examined:

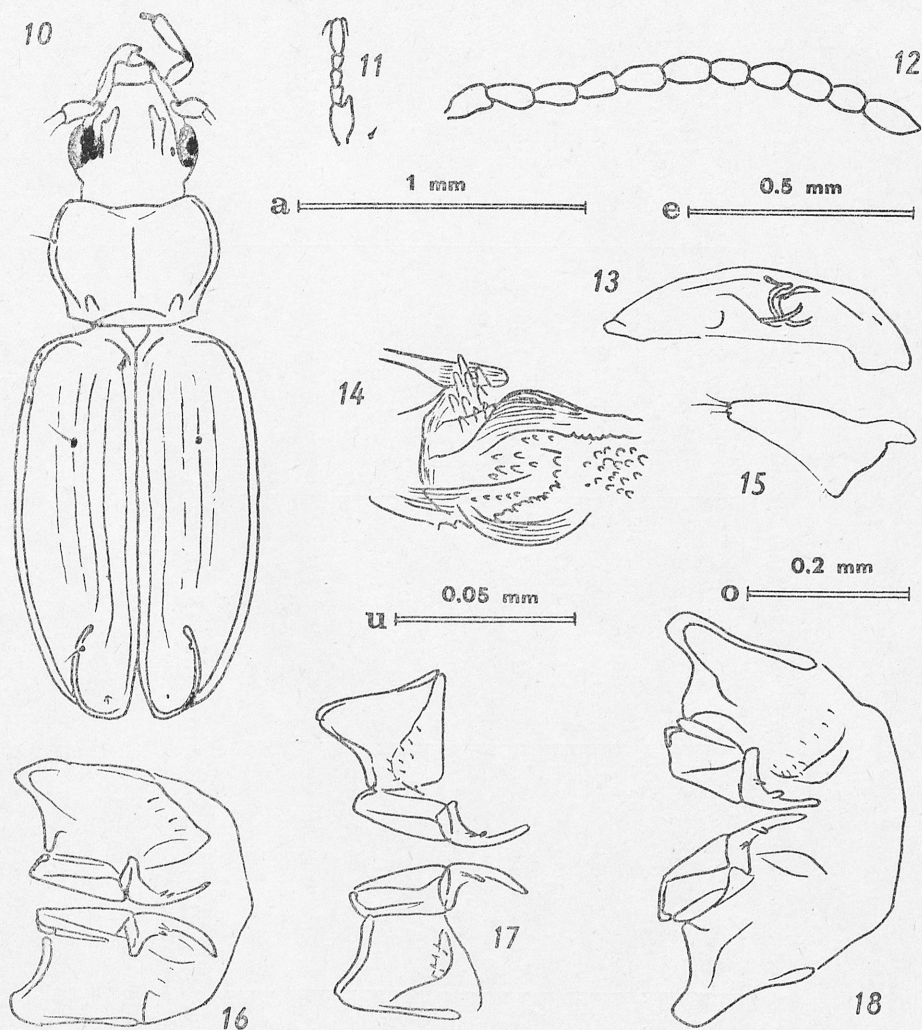
[C] Bank of the River Tuman-gang at Hōngam, 400 m above sea level, 10 IX 1971, 1 ♂ and 1 ♀ (paratypes Nos. 4 and 5) under stones leg. J. PAWŁOWSKI. (ZZS).

[E] Gravel heap over a left tributary of the River Karim-čhōn below a village Posō-ri, 900 m a.s.l., 11 IX 1971, 1 ♂ (paratype No 3), leg. A. SZEPTYCKI (ZZS).

[F] The valley of the River Karim-čhōn above Počhōn-bo, 900 m a.s.l., 1 IX 1971, 1 ♂ (holotype) and 2 ♀♀ (paratypes Nos. 1 and 2) and one uncoloured specimen damaged under stones on a sandy and stony gravel heap, leg. J. PAWŁOWSKI (ZZS).

Derivation of name: I derivate the name of the described species from the Korean word "Džosōn" (or "Čosōn") meaning Korea.

Description of holotype: male 2.08 mm long. Back half of head darkened, the remaining parts of the body almost uniformly dark testaceous. Microsculpture very weak, strongest on the head, hardly visible (at 100-fold magnification) on prothorax and elytrae. 1. and 2. stria distinctly stamped, 3. and 4. hardly marked, 5—7 marked only as indistinct puncta, 8. stamped on one third at the back. Dorsal pore at 4. stria on the border of 4. interval at the end of the first quarter of elytrae. Elytral margin delicately setulose (setulae visible at 100-fold magnification). Recurrent stria slightly curved reaching the fore-part of posterior quarter of elytrae. The base of anterior apical seta close at recurrent stria. 1. joint of anterior protarsus longer and broader than the next, sharpened in its outer part (fig. 11). Habitus of the holotype presented in fig. 10. Genital organ (figs. 13—15) weakly curved, internal sclerites placed almost in the middle of



Figs. 10—18. *Tachys (Eotachys) dzosonicus* sp. n.: 10 — habitus of the holotype, 11 — its protarsus of left foreleg, 12 — its right antenna; 13 — aedoeagus of the holotype, 14 — its inner sclerites, 15 — its left paramere; 16, 17 — hemisterna of paratypes Nos 4 and 5; 18 — hemisterna of paratype No 2; (magnifications: 10 — “a”; 11, 12 — “e”; 13 and 15—18 — “o”; 14 — “u”)

aedoeagus length, left paramere strongly broadened in the posterior part, in fore-part with 3 uneven setae.

Paratypes do not much differ from holotype. Only certain strongly pigmented specimens have joints of antennae very slightly darkened from 4. or 5. joint. Females have somewhat stronger microsculpture. Hemisternum of females (figs. 16—18) characterized with very slender hemisternal stylus.

I present in Tab. II the morphological differences between *T. (E.) dzosonicus* sp. n. and other Far-Eastern species of the sub-genus *Eotachys* JEANN.

Table II

Some differences between East-Asiatic species of the sub-genus *Eotachys* JEANN. (excl. *T. koizumii* HABU)

	<i>T. fasciatus uenci</i> TAN.	<i>T. varsavianorum</i> sp. n. (holotype)	<i>T. pallescens</i> BAT.	<i>T. dzosonicus</i> sp. n. (typical series)	<i>T. uenoianus</i> HABU (holotype)
body length in mm	2.6 — 2.8	2.21	1.9 — 2.0	2.0 — 2.2	2.5
index of pronotum	1.50 — 1.65*	1.49	1.42 — 1.46**	1.36 — 1.48	1.59***
index of elytrae	1.44 — 1.55*	1.50	1.47 — 1.54**	1.40 — 1.55	1.57***
hind angles of pronotum	acute	rectangular	obtuse	obtuse	rectangular
number of dilated joints in protarsus of male foreleg	2	?	1	1	1
situation of elytral dorsal seta (pore)	at basal 1/3 on middle of 4. interval	(protarsi destroyed) at basal 1/3 on 4. stria	at basal 1/3 on 4. stria	at basal 1/4 on 4. stria	at basal 1/3 on middle of 4. interval

* specimens from Tokyo (coll. Mus. Paris in MNP) and paratypes Nos. 15, 16 (ZZS)

** Korean specimens

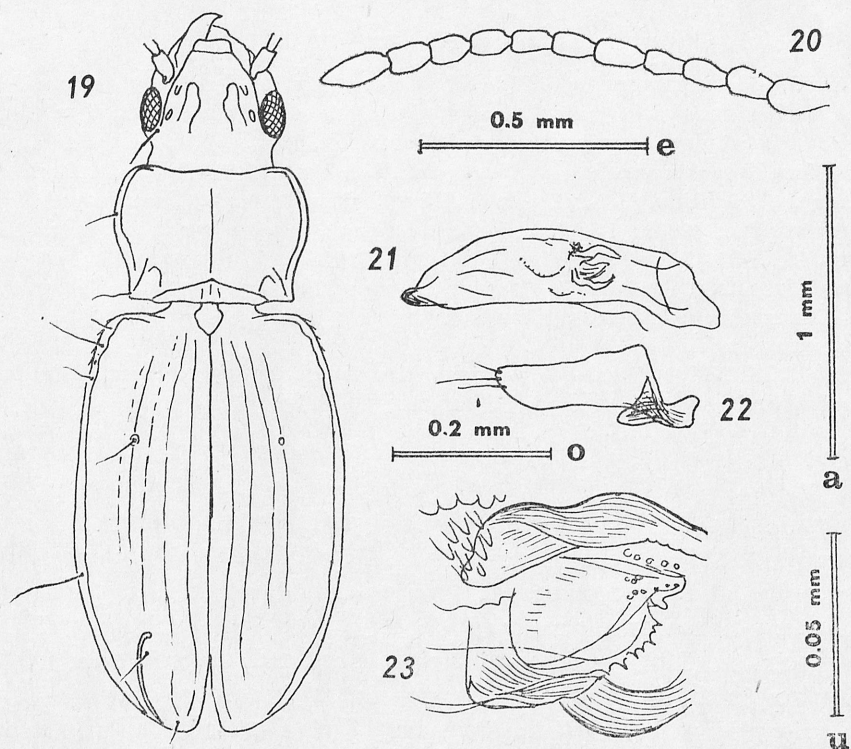
*** after HABU's (1974) description or drawing

Tachys (Eotachys) varsavianorum sp. n.

Material examined:

[O] Phjôngjang, 21 VII 1959, 1 ♂ (holotype) leg. B. PISARSKI & J. PRÓSZYŃSKI (IZW).

Derivation of name: I dedicate the name of the species to the participants of the first four ("Warsaw") zoological expeditions of the Polish Academy of Sciences to Korean People's Democratic Republic: R. BIELAWSKI, C. DZIADOSZ, M. MROCZKOWSKI, B. PISARSKI, J. PRÓSZYŃSKI, A. RIEDEL, and H. SZEŁĘGIE-



Figs. 19—23. *Tachys (Eotachys) varsavianorum* sp. n., holotype: 19 — habitus; 20 — left antenna; 21 — aedeagus; 22 — left paramere; 23 — internal sclerites of aedeagus; (magnifications: 19 — "a"; 20 — "e"; 21, 22 — "o"; 23 — "u")

WICZ, to commemorate their contribution to the knowledge of Korean fauna. Description of the holotype: male, 2.21 mm long. Eyes blackish-brown, forehead light brown, the remaining parts of the body almost uniformly testaceous. Trace of microsculpture on the head and on sides of prothorax, at 100-fold magnification elytrae almost without microsculpture. First two elytral striae distinctly stamped, 3. and 4. interrupted, 5. only marked, 6 and 7 obsolete, 8. stamped on posterior one third of elytrae. Shoulders distinctly marked, their margins delicately setulose (setulae not visible but at 100-fold magnification). Dorsal pore (seta) situated on 4. stria in fore one third part of elytrae. Recurrent stria forms a very soft bow, basis of anterior apical seta almost close to recurrent

stria. Habitus presented on figs. 19. Genital organ (figs. 21—23) slightly bent, internal sclerites just behind the half of aedeagus left paramere (fig. 22) fairly wide, slightly narrowing to the apex; apex ending with three uneven setae. Differences between *T. (E.) varsavianorum* sp. n. and other Far-East species of sub-genus *Eotachys* JEANN. are presented in Tab. II. The relations between *T. varsavianorum* sp. n. and *T. uenoianus* HABU, described from Formosa, need further study in default of drawing of male genital organ in the paper of HABU (1974).

Tachys (s. str.) *quadrillum* SCHAUM, 1860

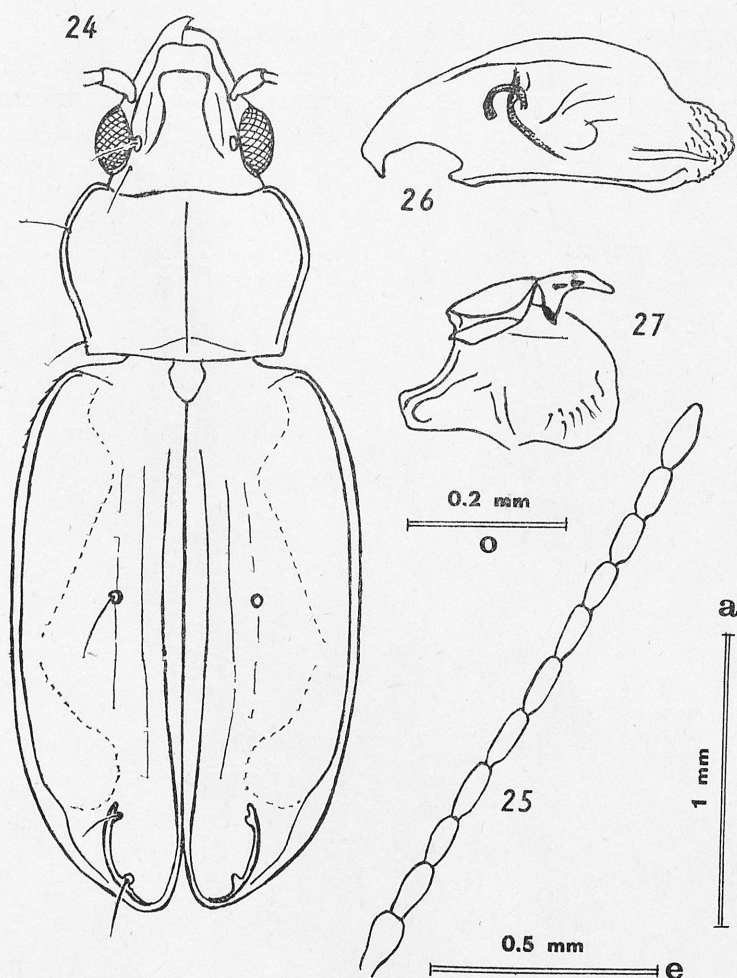
Tachys quadrillum: ANDREWES, 1925: 372 (New Guinea; Ceylon: Weligama; Annam; Formosa: Anping, Alikang; Siam; India: Rambha and Berkuda Island in Lake Chilka, distr. Ganjam of Madras; Batchian; China: Haining, Amoy); DARLINGTON, 1962: 429 (Ceylon; India; Celebes; southern China; New Guinea: Madang, Garove Isl., Lea, Port Moresby); JEDLIČKA, 1965a: 171 (India, Annam, Südhina, Taiwan, Ceylon, Neu Guinea, Samoa). *Tachys quadrillum* var. *impictus* JEDLIČKA, 1965a: 171 (Philippinen, Taiwan). *Tachys quadrillum* var. *languidus* ANDREWES, 1925: 374 (Formosa: Anping); JEDLIČKA, 1965a: 171 (Taiwan). *Tachys quadrillum* ab. *ampingi* JEDLIČKA, 1965a: 171 (Taiwan, Amping). *Tachys sexguttatus*: HABU & BABA, 1962: 47 (Tanegashima: Hommura, Kumano)*.

Material examined:

[R] Vaudo, 18 IX 1971, 1 ♂ and 1 ♀ under stones on the border of a saline habitat overgrown with *Suaeda maritima* (L.) DUN., leg. J. PAWŁOWSKI (ZZS).

Description of Korean specimens: male 2.96 mm long; head and prothorax dark brown, in the middle of elytrae a brown elongated streak darkening towards the base and apex, light spots in the form of pale streaks, lighter in apical part (ab. *ampingi* JEDL. ?); antennae brown from the middle of 4. joint; other joints of antennae, palpi, and legs testaceous. Female 2.64 mm long with typical distribution of spots: anterior ones elongated, dark testaceous, posterior round, lighter. In both specimens distinct microsculpture on the head, on prothorax (at 60-fold magnification) in the form of rubbed away net, in females also a trace of transverse microsculpture on elytrae. Two first elytral striae regularly stamped, 3. and 4. interrupted, 5—7 obsolete, 8. interrupted on the fore-part of posterior one third of elytrae and appears as far as before the shoulder. Two first joints of pro-tarsi of male forelegs dilated, first joint considerably elongated. Habitus of male presented in fig. 24, other details in Tab. III. Dorsal pore on 3. stria in the fore-part of elytrae but fairly near their middle (between 1/3 and 1/2 of their length). Recurrent stria in the form of a soft bow, base of apical seta fairly close the fore-end of recurrent stria but distinctly separated from it. Elytral margins delicately setulose (setulae visible already at 60-fold magnification). The above description agrees with ANDREWES's redescription (1967) as well as that of JEDLIČKA (1965a). Genital organ of male (fig. 26) with short broad aedeagus; internal sclerites just behind the middle of aedeagus; left paramere fairly

* After HABU & BABA (1962) *T. quadrillum* SCHAUM is a younger synonyme of *T. sexguttatus* FAIRM., 1849. In my opinion this decision needs more examination particularly the comparison of holotypes of both taxa.



Figs. 24—27. *Tachys* (s. str.) *quadrillum* SCHAUM from Vaudo: 24 — habitus of the male, 25 — its right antenna, 26 — its aedeagus; 27 — hemisternum of the female (magnifications: 24 — “a”: 25 — “e”; 26, 27 — “o”)

narrow and regularly narrowing towards apex with one short and two long setae. Hemisternum of female (fig. 27) with a fairly short but sharp hemisternal stylus.

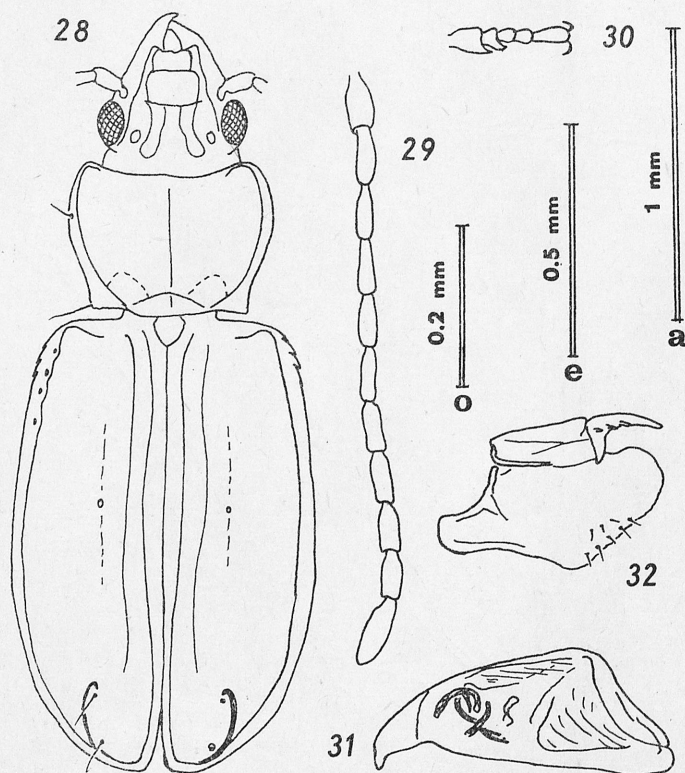
Tachys (s. str.) *gyotokuensis sohei* ssp. n.

Material examined:

[R] Vaudo, a muddy bank of the estuarium of the River Tedōng-gang above the line of tides, 18 IX 1971, 2 ♂♂ (holotype and paratype No 1) and 2 ♀♀ (paratypes Nos 3 and 4) under stones leg. J. PAWŁOWSKI (ZZS).

Derivation of name: I derivate the name from the Korean word “Sō-he” (= Western Sea); this is the Korean name of Yellow Sea. Description of the holotype: male 2.50 mm long. Eyes blackish-brown, joints of antennae darkened

beginning from the half of the 4. one, the remaining parts of the body dark-testaceous. At 60-fold magnification isodiametric microsculpture fairly visible on head (especially in the region of forehead furrows); on prothorax microsculpture very weak while on elytrae only its traces. Two first elytral striae in the form of depressions, 3—7 obsolete or fragmentarily marked with delicate



Figs. 28—32. *Tachys* (s. str.) *gyotokuensis sohei* ssp. n.: 28 — habitus of the holotype; 29 — right antenna of the paratype No 1; 30 — protarsus of the left foreleg of the holotype; 31 — aedoeagus of the holotype; 32 — hemisternum of the paratype No 1 (magnifications: 28 — “a”; 29, 30 — “e”; 31, 32 — “o”)

punctures, 8. interrupted in the fore-part of the posterior one third of elytrae. Dorsal pore on 3. stria just before the middle of the length of elytrae. Recurrent stria fairly bowed, in the fore-part bent backwards; base of anterior apical seta near the end of recurrent stria. In the region of shoulders elytral margins delicately denticulate (visible at 60-fold magnification). Two first joints of anterior pro-tarsi dilated and strongly sharpened from inside, the first somewhat longer than the other. Genital organ with a short broad aedoeagus (fig. 31); internal sclerites in the back part of aedoeagus; left paramere narrow with two long setae on the apex. The details of the external structure of the holotype are presented in figs. 28 and 29.

Table III

Some differences between East-Asiatic species of the sub-genus *Tachys* s. str.

	<i>T. plagiatus</i> <i>shimosae</i> TAN.	<i>T. quadrillum</i> SCHAUM (Korean specimens)	<i>T. koreanorum</i> sp. n. (typical series)	<i>T. gyotokuensis</i> <i>gyotokuensis</i> TAN.	<i>T. gyotokuensis</i> <i>sohei</i> ssp. n. (typical series)
body length in mm	2.66*; 3.04**	2.64 (♀); 2.96 (♂)	2.00—2.34	1.75—2.33	2.40—2.50
width proportion — pronotum: head	1.26*; 1.31**	1.35 ; 1.38	1.30—1.34	1.23—1.29***	1.31—1.36
index of pronotum	1.50*; 1.53**	1.51 ; 1.48	1.33—1.41	1.39—1.47***	1.41—1.42
index of elytrae	1.50*; 1.54**	1.49 ; 1.55	1.47—1.53	1.52—1.57***	1.42—1.50
eyes	prominent	moderately flattened	flattened	moderately flattened	moderately flattened
hind angles of pronotum	obtuse	obtuse	obtuse	acute	acute

* holotype (♀)

** specimen (♀) from "locus typicus" (FASSATI's coll., MNP)

*** certain paratypes (♀ without No in FASSATI's coll., MNP; ♀ No 8, and ♂ No 10 in coll. ZZS)

Paratypes do not differ from the holotypes. Body length: No 1 — 2.42 mm, No 2 — 2.50 mm, No 3 — 2.40 mm. Hemisternum of females with a not too long but sharpened hemisternal stylus (fig. 32).

The differences in relation to the nominal sub-species as well as to other East-Asiatic species of the sub-genus *Tachys* s. str. are presented in Tab. III.

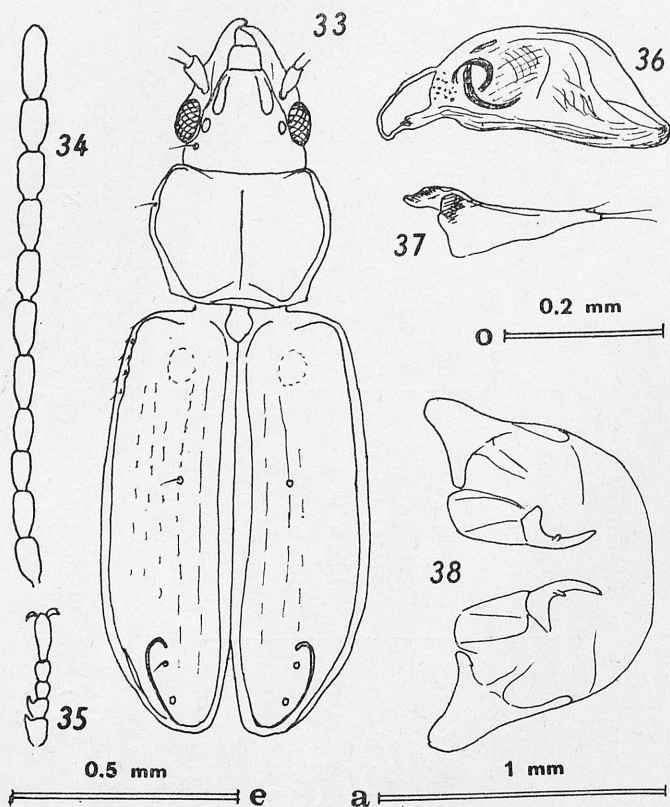
Tachys (s. str.) *koreanorum* sp. n.

Material examined:

[R] Vaudo, a saline habitat with *Suaeda maritima* (L.) DUN., 18 IX 1971, 5 ♂♂ (holotype and paratypes Nos 2—5) and 1 ♀ (paratype No 1) in rifts of drying mud leg. J. PAWŁOWSKI (ZZS). Nampho, a peninsula with a town, 28 V 1965, 1 ♂ (paratype No 6) under stones and plants on seashore leg. M. MROCZKOWSKI and A. RIEDEL (IZW).

Derivation of name: I dedicate the name to the workers of the Zoological Institute of the Korean Academy of Science to commemorate the Polish-Korean collaboration in the field of zoology.

Description of holotype: Male. Body length 2.18 mm. Head light brown, eyes dark brown, antennae slightly darkened from 3. or 4. joint, the remaining



Figs. 33—38. *Tachys* (s. str.) *koreanorum* sp. n.: 33 — habitus of the holotype, 34 — its right antenna, 35 — its protarsus of the right foreleg, 36 — its aedoeagus, 37 — its left paramere; 38 — hemisterna of the paratype No 1 (magnifications: 33 — "a"; 34, 35 — "e"; 36—38 — "o")

parts of body dark testaceous. At 60-fold magnification isodiametric microsculpture fairly well visible on the head, on the fore-part of prothorax only its traces, elytrae without discernible microsculpture. First four elytral striae marked with indistinct depressions, 5—7 discernible as delicate punctures, the depression of 8. stria interrupted on a considerable length beginning from the posterior one third of the length of elytrae. Dorsal pore on 3. stria just before the middle of elytrae. Recurrent stria strongly curved backwards, anterior apical seta lies apart from the end of recurrent stria. In the region of shoulders elytral margins delicately setulose (setulae visible at 100-fold magnification). In the anterior part of elytrae near their base delicate irregular stamps. Two first joints of anterior pro-tarsi dilated and strongly sharpened on the inner side. Genital organ with a short broad aedoeagus (fig. 36), internal sclerites not complicated, situated in the posterior part of aedoeagus; left paramere regularly narrowing towards the apex which ends with 2 longer setae; third short seta in a certain distance from the apex. The details of the external structure of the holotype are presented in figs. 33—35.

The body length of paratypes: No 1 — 2.26; No 2 — 2.34; No 3 — 2.10; Nos 4 and 5 — 2.00; No 6 — 2.15 mm. Hemisternum of female (fig. 38) with virgate hemisternal stylus.

The differences in relation to the remaining East-Asiatic species of the sub-genus *Tachys* s. str. are presented in Tab. III.

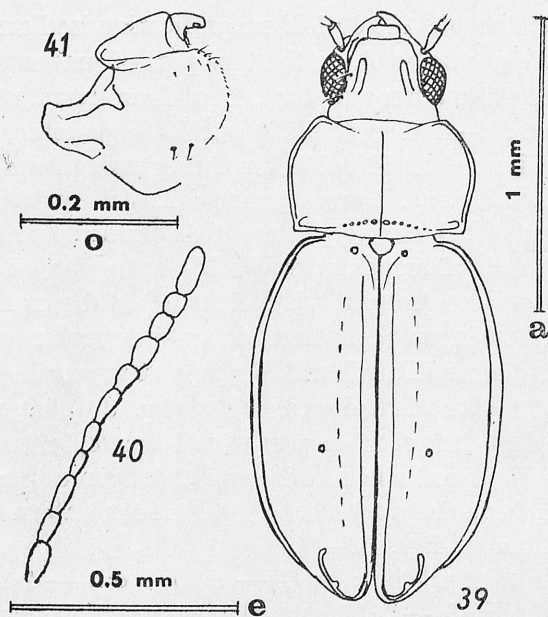
***Tachys (Elaphropus) latissimus* MOTSCHULSKY, 1851, sensu DARLINGTON 1962**

Tachys bifoveatus: ANDREWES, 1925: 476 (Eastern Siberia, Japan, Formosa, Queensland); NAKANE & al., 1963: 25 (Hokkaido, Honshu, Sikoku, Kyushu). *Tachys bifoveolatus* (!): JEDLIČKA, 1965a: 174 (Japan, Ostsibirien, Tonkin, Taiwan, Queensland). *Elaphropus bifoveolatus*: KRYZHANOWSKIJ, 1970: 174 (USSR: Amurskaja oblast, Primorskij Kraj; Japonia, Kitaj, Indo-Malajskaja oblast, severnaja Avstralija).

Material examined:

[P] The environs of Jongak-san, 16 VIII 1971, 1 ♀ among wet plants at a loamy bank of the river Sunha-gang leg. A. SZEPTYCKI (ZZS).

The description of the Korean specimen: body length 1.67 mm. Light testaceous, only the head and antennae (beginning from the third joint), the suture, and the marginal part of elytrae and of prothorax darker; eyes black. Only on the head and prothorax traces of microsculpture visible at 60-fold magnification. First elytral stria distinct, 2. hardly visible, 3—7 obsolete; the depression of 8. stria from the back to the middle of elytrae, then it disappears and again appears at shoulder pores. The only dorsal pore in place of the obsolete 3. stria, distinctly behind the middle of the length of elytrae. Recurrent stria short, bent, lying nearer the outer elytral margins than the suture. The base of apical seta close at recurrent stria near the apex of elytrae. Other details of the



Figs. 39—41. *Tachys (Elaphropus) latissimus* MOTSCH., specimen from Jongak-san: 39 — habitus; 40 — right antenna; 41 — hemisternum (magnifications: 39 — “a”; 40 — “e”; 41 — “o”)

external structure are presented in figs. 39, 40. Hemisternal stylus (fig. 41) strongly shortened and obtuse.

A comparison of *T. latissimus* MOTSCH. with other Far-Eastern species of sub-genus *Elaphropus* MOTSCH. presents Tab. IV.

Table IV

Some differences between East-Asiatic species of the sub-genus *Elaphropus* MOTSCH.

	<i>T. latissimus</i> MOTSCH.	<i>T. zouhari</i> JEDL.	<i>T. nipponicus</i> HABU & BABA
length in mm	1.9—2.1*	1.64—1.94**	2.1—2.2***
index of pronotum	1.64**	1.44**	1.54***
anterior dorsal pore	absent	before the middle	absent
posterior dorsal pore	behind the middle	behind the middle	at the middle
wings	normal	reduced	reduced
3 rd dorsal stria	absent	vanishing	absent

* after ANDREWES (1925) and JEDLIČKA (1965a)

** Korean specimens

*** after HABU & BABA (1967)

Tachys (Elaphropus) zouhari JEDLIČKA, 1961

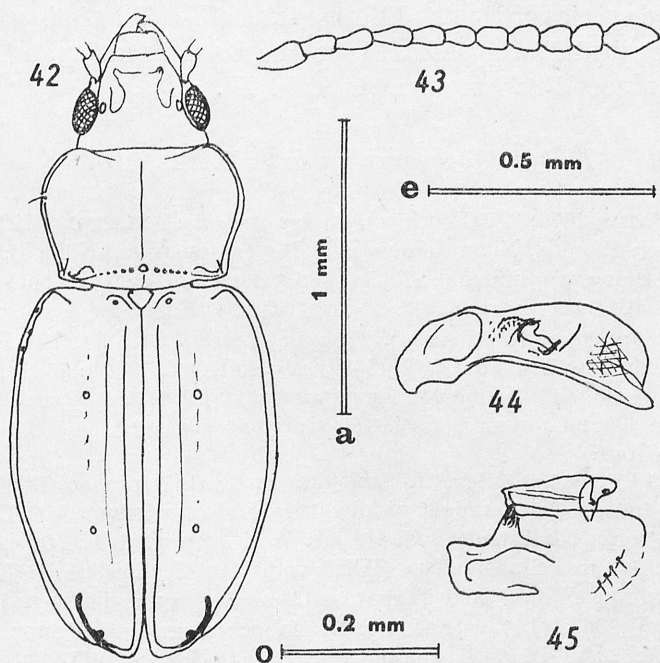
Tachys zouhari JEDLIČKA, 1961: 157 (Peking); 1965a: 176 (Peking, Suiyang, Werchne Udinsk).

Material examined:

[L] Džamo-san Hills above a village Džamo-ri, 27 VIII 1971, 6 ♂♂, 1 ♀ in the leaf mulch at a stream flowing through wet ground, leg. J. PAWŁOWSKI & A. SZEPTYCKI (ZZS).

[O] Phjǽngjang, Botanical Garden, 15 IX 1971, 2 ♂♂, 5 ♀♀ under stones and mats on wet loamy ground, leg. J. PAWŁOWSKI & A. SZEPTYCKI (ZZS).

Description of Korean specimens: upper surface dark brown, first joints of antennae and legs dark testaceous, eyes black, the under side light brown. Submentum without pores. No distinct microsculpture at 60-fold magnifi-



Figs. 42—45. *Tachys (Elaphropus) zouhari* JEDL.: 42 — habitus of one male from Džamo-san, 43 — its right antenna, 44 — its aedeagus; 45 — hemisternum of the female from Džamo-san (magnifications: 42 — “a”; 43 — “e”; 44, 45 — “o”)

cation. 1. elytral stria strongly impressed, 2. weaker, 3. interrupted, 4—7 obsolete, 8. interrupted on a short sector in the middle of the length of elytrae. Dorsal pores on 3. stria, situated about one third of the length of elytrae in the fore- and back part. Recurrent stria weakly bent, very near the elytral margins. Base of apical seta at the recurrent stria in its back half. Genital organ of males (fig. 44) widened and rounded in the apical part, internal sclerites in the middle of the length of aedeagus, left paramere regularly narrowing towards the apex armed with three short setae. Hemisternum of females with a fairly reduced and rounded hemisternal stylus. Other details of the external structure are presented in figs. 42, 43. Also see Tab. IV.

KRYZHANOVSKIY (1970) unjustly regards the discussed taxon as a synonyme of *T. latissimus* MOTSCH. "судя по описанию и рисунку" ("judging from the description and picture") since both indicate that *T. zouhari* JEDL. has two dorsal pores; while *T. latissimus* MOTSCH. has one dorsal pore only. On the other hand JEDLIČKA (1965a: fig. 46) made a mistake presenting the dorsal pore as situated on the third interval, the same reporting in the description ("der hintere Porenpunkt steht im 3. Zwischenraum"). It is not true. I saw the holotype and 11 paratypes (MNP) *T. zouhari* JEDL. from Peking, Suiyang, and "Werchne Udinsk" (= Ulan-Ude, USSR). In all these specimens the second pore is distinctly situated on the partly obsolete third elytral stria, having the same position in Korean specimens. In spite of this mistake in the description, it is doubtless a good species distinctly differing from allied *T. latissimus* MOTSCH. and from lately described *T. nipponicus* HABU and BABA from Japan (1967). I listed the main differences between them in Tab. IV.

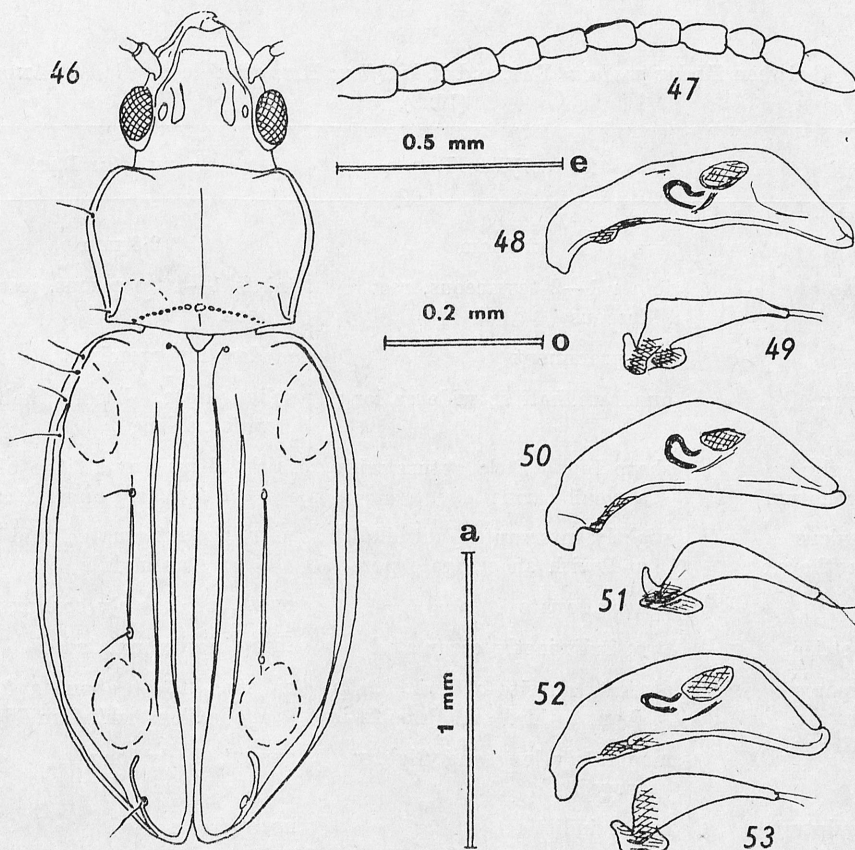
Tachys (Tachyura) gradatus BATES, 1873

Tachys gradatus BATES, 1873: 331 (Foochow). *Tachys gradatus*: ANDREWES, 1925: 434 (Fuchau, Shanghai, Kiang-si; Haining, Nimrod Sound and Da-lean-saen near Ningpo); NAKANE & al., 1963: 25 (Honsu, Okinawa); JEDLIČKA, 1965a: 185 (Shanghai, Kiangsi, Foochow, Szetschuan, Schantung; Aomori). *Tachys gradatus* (!): YANO, 1941: 25 (Keijo; Tsingtao). *Tachys coreanus* JEDLIČKA, 1932: 80; 1965a: 181 (Gensan). *Tachys chinensis* JEDLIČKA, 1932: 81; 1965a: 186 (Schantung: Jentschoufu; Tientsin). (?) *Tachys goetzi* JEDLIČKA, 1965b: 75 (Seishin). *Tachyura gradata*: TANAKA, 1956: 211 (Okinawa); KRYZHANOVSKIY, 1970: 180 (Gansu, Šansi, Fučian). *Tachyura coreana*: KRYZHANOVSKIY, 1970: 180 (Sariyon, Vonsan).

Material examined:

- [H] Hamhyng, 13 IX 1966, 1 ♀ leg. H. SZEŁĘGIEWICZ & C. DZIADOSZ (IZW).
- [J] Vönsan, 1 IX 1966, 1 ♂, 1 ♀ at night with light leg. H. SZEŁĘGIEWICZ & C. DZIADOSZ (IZW); 15 IX 1970, 2 ♂♂ on a beach under seaweed leg. R. BIELAWSKI & M. MROCZKOWSKI (IZW). "Gensan, Korea", 1 ♀ ex coll. JEDLIČKA (MNP) with identification labels: "*Tachys* sp. mihi ignotus H. E. ANDREWES det." and "Type" and "*coreanus* sp. n. det. ing. JEDLIČKA".
- [L] Dzamo-ri, 27 V 1965, 11 ♂♂, 11 ♀♀ leg. M. MROCZKOWSKI & A. RIEDEL (IZW).
- [M] Sökam-Čösudži, 20 VIII 1971, 1 ♂ on the beach over the lake; 21 VIII 1971, 1 ♂ on a gravel heap with a marsh and 1 ♀ lured to the light of UV lamps on a hill above the lake; 23 VIII 1971 2 ♂♂, 3 ♀♀ on beaches with small marshes on both sides of the lake; leg. J. PAWŁOWSKI (ZZS).
- [N] Junha-ri, 13 IX 1970, 1 ♂, 2 ♀♀, leg. R. BIELAWSKI & M. MROCZKOWSKI (IZW).
- [O] Phjōngjang, 2 IX 1959, 1 ♂ leg. B. PISARSKI (IZW). Mankjōngde 31 VIII 1970, 1 ♂ leg. R. BIELAWSKI & M. MROCZKOWSKI (IZW).
- [P] Foot of Jongak-san Hills, 16 VIII 1971, 5 ♂♂, 5 ♀♀ on a loamy banks of the River Sunhangang leg. J. PAWŁOWSKI & A. SZEPTYCKI (ZZS).
- [Q] Thesōng, 24 VIII 1971, 2 ♀♀ on a sandy and stony beach leg. J. PAWŁOWSKI; 24/25 VIII 1971, 2 ♂♂, 3 ♀♀ lured with the light of a UV lamp on the western bank of the lake in the distance of 200 m from the beach, leg. J. PAWŁOWSKI & J. RAZOWSKI; 25 VIII 1971, 2 ♂♂, 2 ♀♀ on the southern muddy bank of the lake with small puddles, leg. A. SZEPTYCKI; (ZZS).
- [R] Usan-ri, 28 V 1965, 1 ♂ leg. M. MROCZKOWSKI & A. RIEDEL (IZW).
- [S] Sarivōn, 11 VII 1956, 2 ♀♀ leg. M. MAGYAR (MNP); one of the specimens with an identification label: "*formosanus* JEDL., det. ing. JEDLIČKA".
- [T] The environs of Sinčhōn, 16 IX 1971, 1 ♂, 2 ♀♀ on a river bank covered with a cracked layer of mud, leg. J. PAWŁOWSKI (ZZS).

In Tab. V and VI are compared the descriptions of ANDREWES (1925) and JEDLIČKA (1932, 1965a, b) concerning *T. gradatus* BAT. and *T. laetificus* BAT. and in the second case also "*T. coreanus*", "*T. goetzi*", and "*T. chinensis*". As the comparison indicates the main difference between the first two forms is the absence of a distinct third elytral stria in the first form and its presence in the



Figs. 46—53. *Tachys (Tachyura) gradatus* BAT.: 46 — habitus of one male from Thesong, 47 — its right antenna; 48 — aedeagus of the male from Jentschoufu, China (ex coll. JEDLIČKA, MNP), 49 — its left paramere; 50 — aedeagus of one male from Aomori, Japan (ex coll. JEDLIČKA, MNP; specimen identified by JEDLIČKA as "*T. laetificus* BAT."), 51 — its left paramere; 52 — aedeagus of the cotype of "*T. chinensis*" from Jentschoufu, China (ex coll. JEDLIČKA, MNP), 53 — its left paramere (magnifications: 46 — "a"; 47 — "e"; 48—53 — "o")

second one. Both BATES and JEDLIČKA had to their disposal only single typical specimens, therefore they were not able to evaluate the individual variability of the species. The application of the criterion of the obsolescence or absence of third stria and then of the occurrence, obsolescence, or absence of spots on elytrae resulted in the separation of the very variable species in the keys of ANDREWES (1925) and of JEDLIČKA (1965a). Thus in ANDREWES's key in the "politus-group" 57 thesis ("Elytra with three impressed dorsal striae") already separates

both taxons, its contradiction is thesis 74: "Elytra with two impressed dorsal striae (3 sometimes visible but hardly impressed)". In consequence "*T. gradatus*" appears in this key at 67. thesis, while "*T. laetificus*" as far as at 129. thesis; later on the descriptions are similarly separated (pp. 434, 457). The problem was still more complicated in JEDLIČKA's key where (besides the 3. stria) greas

Table V

Differences between *Tachys gradatus* BAT. and *T. laetificus* BAT. after descriptions of ANDREWES (1925)

	<i>T. laetificus</i> BAT.	<i>T. gradatus</i> BAT.
length	2.5 mm	2.8 mm
antennae	joints 1—2 testaceous, rest fuscous	joints 1—4 testaceous, rest fuscous
eyes	not prominent	moderately prominent
prothorax	quadrate, half as wide as long	subquadrate, barely half as wide as long
hind angles of pronotum	sharp but a little obtuse with a small carina	fairly sharp but a little obtuse with a clearly marked carina
basal sulcus of prothorax	slightly interrupted at middle and with an elongate pore	narrowly interrupted and with a pore at middle
elytrae	convex, ovate	ovate, moderately convex
dorsal striae	two, indistinctly crenulated	three, not crenulated
dorsal pores	distinct, on site of stria 3., at about a third and three fifths	on stria 3., at about a fourth and rather behind middle
striele	moderately long and slightly curved	curved, fairly long
microsculpture	rather indistinct	no appreciable

importance was attributed to the appearance of spots on elytrae. In consequence "*T. laetificus*" appears as many as four times in various parts of the key (aberrations!) in theses and antitheses: 2, 6, 11, and 14, "*T. coreanus*" appears in thesis 6, "*T. gradatus*" in thesis 20, and "*T. chinensis*" in antithesis 21. The descriptions of species in "*Politus*-Gruppe" are similarly divided: "*T. coreanus*" appears as species 32, "*T. laetificus*" as species 39, "*T. gradatus*" as 46, and "*T. chinensis*" as 48.

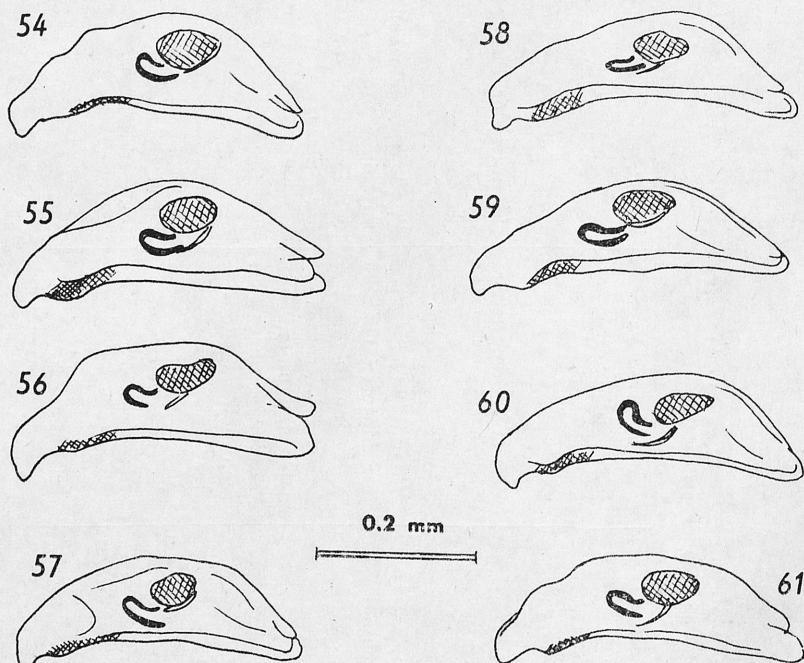
Since relatively numerous Korean material (67 specimens) was available, it was possible for me to state that the specimens with well formed 3. stria and with the anterior spots greater than the posterior ones constitute almost 60 per cent of the population. In the remaining specimens various degrees of the obsolescence of the third stria (including its absence) and of the reduction of

Table VI

Differences between *Tachys gradatus* BAT., *T. laetificus* BAT., *T. chinensis* JEDL., *T. coreanus* JEDL., and *T. goetzi* JEDL. after JEDLIČKA'S (1965 a, b) descriptions

	<i>T. gradatus</i> BAT.	<i>T. laetificus</i> BAT.	<i>T. coreanus</i> JEDL.	<i>T. chinensis</i> JEDL.	<i>T. goetzi</i> JEDL.
Length	2.8 mm	2.5 mm	2.5 mm	2.4 mm	3.0 mm
first joints of antennae	"2—3 Fühlerglieder (rotgelb)"		"Drei Fühlerglieder gelb"	"Wurzel der Fühler rot"	"Zwei Fühlerglieder rotgelb (Rest verdunkelt)"
elytral spots	"Flügeldecken mit vier kleinen, runden, rotgelben Makeln; manchmal fehlt die Apikalmakel ... oder ... Humeralmakel"		"Jede Flügeldecke im hinteren Drittel mit einer kleinen, runden, ... roten Makel, Humeralmakel ist nur schwach angedeutet"	"(jede Flügeldecke) mit einer runden, gelben Makel vor der Spitze"	"(jede Flügeldecke) mit einer sehr kleinen rundlichen Humeralmakel rotgelb"
dorsal striae	"Drei tiefen Streifen"	"zwei deutliche, tiefen und glatten Streifen"	"zwei tiefen, glatten Streifen"	"drei tiefen, glatten Streifen"	"drei deutliche, glatten und ziemlich tiefen Streifen"

anterior (more rarely of posterior) spots (including their disappearance) on elytrae were found, no correlation between the absence of the third stria and the disappearance of spots being observed (see Tab. VII). No basic differences were noted in the investigated genital organs of males; in my opinion the somewhat different shape and position of the internal sclerite of particular specimens are within the limits of individual variability (figs. 54—61). Greater variability is observed in the structure of hemisternal stylus of females (figs. 66—73). We

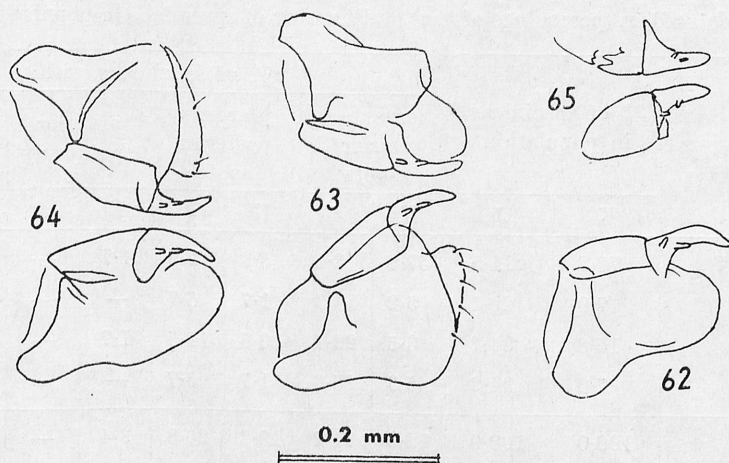


Figs. 54—61. Aedeagi of males of *Tachys (Tachypura) gradatus* BAT. from: Sökam-Čösudzi (54, 57, 61), Vönsan (55), Džamo-ri (56, 60), Jongak-san (58), and Thesöng (59)

observe here the whole range of variability from slender bent to thicker straight ones, however, in both cases no correlation occurs between the shape of genital organs and the presence or absence of the 3. stria or of spots on elytrae.

In the compared fairly numerous Japanese population from Aomori (30 specimens identified as "*T. laetificus*" and 1 specimen as "*T. gradatus*" from JEDLIČKA's collection, MNP) individuals with various degrees of obsolescence of 3. elytral stria dominate (Tab. VII), the difference in the size of anterior and posterior spots being less than in Korean specimens. In the compared genital organs of males identified by JEDLIČKA as "*T. laetificus*" and "*T. gradatus*" (in the last case also of Chinese specimens) no significant differences were noted (figs. 48—53). Virgate type of hemisternal stylus prevails in females from Japan (figs. 62, 64), however, medium stumpy type also occurs (fig. 63). Also, no significant differences in genital organs between Korean specimens of *T. gradatus* BAT. and Chinese specimens identified by JEDLIČKA as "*T. chinensis*" (figs. 52, 53, 65).

I also examined the co-variance of the length and width of elytrae which is regarded as a good index of allied species in the family *Carabidae*. The relevant diagrams (figs. 76, 77) offer no basis for finding a correlation between the proportions of elytrae and the absence of the third stria, while a little mean difference in the proportions may be observed between the Korean and Japanese populations.



Figs. 62—65. Hemisterna of *Tachys (Tachyura) gradatus* BAT.: 62 — of one female from Inagawa, Japan (ex coll. JEDLIČKA, MNP; specimen identified by JEDLIČKA as "*T. laetificus* BAT."); 63, 64 — of two females from Aomori, Japan (ex coll. JEDLIČKA, MNP; specimens identified by JEDLIČKA as "*T. laetificus* Bat."); 65 — of one female from Tientsin, China (ex coll. JEDLIČKA, MNP; specimen identified by JEDLIČKA as "*T. chinensis*")

Considerable differences in body lengths reported in the descriptions of individual taxa discussed here (from 2.4 mm for "*T. chinensis*" to 3 mm for "*T. goetzi*"; Tab. VI) are still wholly in the dispersion of length of Korean specimens of *T. gradatus* BAT. (figs. 74, 75). On the whole it amounts to 2.4—3.1 mm, i.e. 2.48—2.88 mm in males and 2.57—3.08 in females (I measured 25 ♂♂ and 29 ♀♀). The measurement of 35 specimens from Japan (18 ♂♂ and 17 ♀♀ from JEDLIČKA's collection, MNP, in which 1 male identified as "*T. gradatus*", other specimens as "*T. laetificus*" and among them the allotypes of aberrative forms: *T. l. japonicus* JEDL. and *T. l. aomorii* JEDL.) indicates that on the average they are smaller: total dispersion being 2.3—2.9 mm (♂♂: 2.34—2.82 mm, ♀♀: 2.40—2.88 mm). In JEDLIČKA's collection 6 specimens from China were also found: 3 males of the body length 2.40 mm (among them a cotype of "*T. chinensis*") and 3 females of the body length 2.51, 2.54, and 2.60 mm (first of them identified as "*T. chinensis*" and the other two as "*T. gradatus*").

In Tab. VI the differences in the interpretation of the colour of the first four joints of antennae are also striking. However, careful examination revealed following colours in all investigated specimens (also Japanese ones): the first two joints light, the next two partly darkened (apical parts) and only the joints

from 5. to 11. are wholly darkened. In more strongly coloured specimens 3. and 4. joint may be easily classified as darkened, while in more weakly pigmented they are similarly coloured as the first two joints.

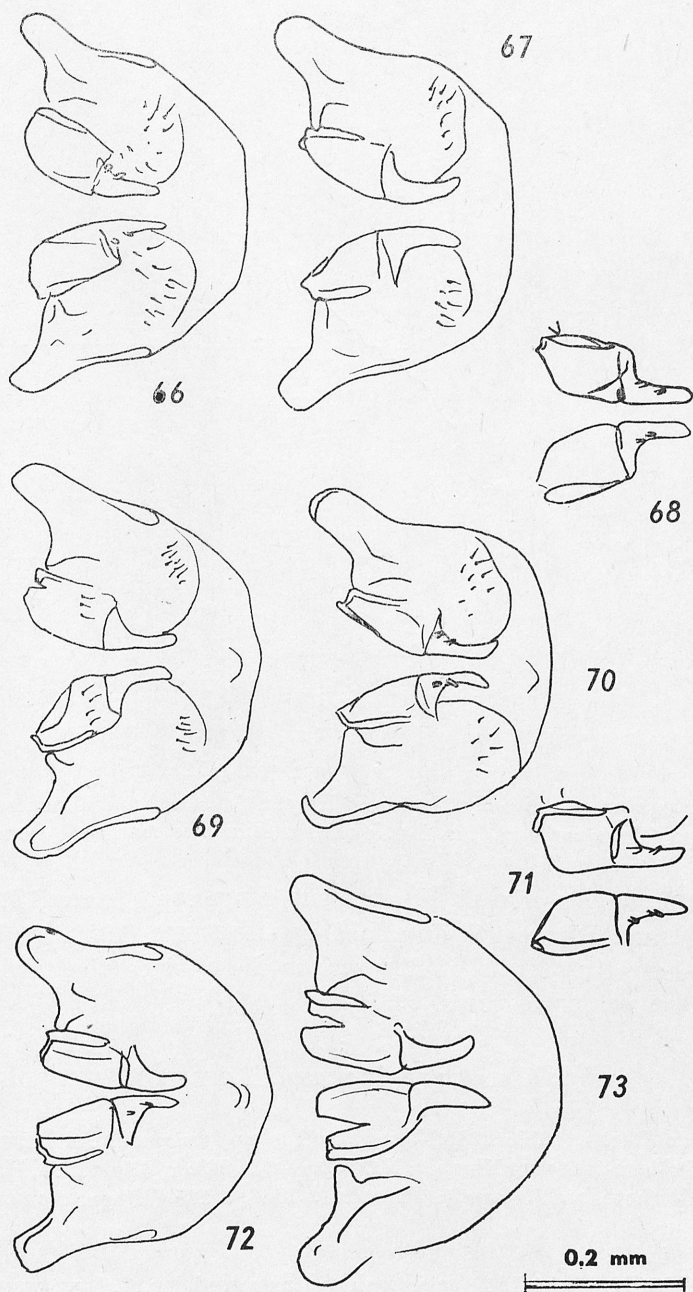
Table VII

Aspect of the 3rd stria and spots on elytrae among Korean (K) and Japanese (J) specimens of *Tachys gradatus* BAT. (percentage of the total number of specimens in population examined)

3 rd stria	% of specimens in population		% of specimens with:							
			larger anterior spots		larger posterior spots		anterior spots only		posterior spots only	
	K	J	K	J	K	J	K	J	K	J
normal	70.2	11.5	57.9	8.6	5.3	2.9	1.7	—	5.3	—
interrupted	7.0	20.1	5.2	14.3	1.7	5.7	—	—	—	—
traced only	15.8	34.2	3.5	22.7	10.5	11.5	1.7	—	—	—
absent	7.0	34.2	5.3	25.6	1.7	5.7	—	—	—	2.9
total	100.0	100.0	72.0	71.2	19.2	25.8	3.4	—	5.3	2.9

Recapitulation: I found the following statistical differences between the investigated Korean and Japanese populations: on the average Korean specimens are greater and present greater sexual dimorphism than the Japanese population (chiefly from Aomori, N. Honsiu); the majority of Korean specimens have a normal deeply impressed 3. elytral stria, while in the Japanese population specimens with the 3. stria obsolete or only weakly marked prevail (compare Tab. VII); among Korean females a stumpy type of hemisternal stylus prevails and among the Japanese females — a virgate one. The above-mentioned statistical differences are in favour of the assumption that in Korea a sub-species *T. gradatus* BAT., different from that in Japan, probably occurs. Since in my opinion there is no reason for the identification of two "good" species, I propose to keep the name "*T. gradatus*" as more often used and to reserve the name "*laetificus*" for a conceivable Japanese sub-species. Statistical differences found for the investigated Korean and Japanese population do indicate sub-species differences, but since there is no possibility of comparing them with any greater series from "terra typica" of *T. gradatus* BAT., i.e. from North China, proper taxonomic decisions are not possible. Following eventualities may be considered:

- I. *Tachys gradatus gradatus* BAT. — North China, Korea
Tachys gradatus laetificus BAT. — Japan
- II. *Tachys gradatus gradatus* BAT. — North China
Tachys gradatus coreanus JEDL. — Korea
Tachys gradatus laetificus BAT. — Japan.

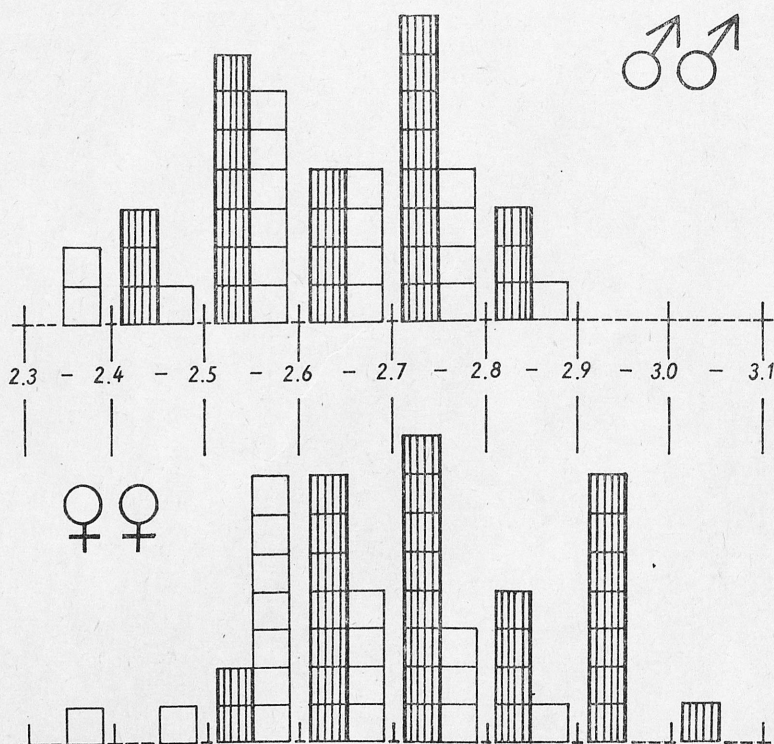


Figs. 66—73. Hemisterna of Korean specimens of *Tachys* (*Tachyura*) *gradatus* BAT. from: Sökam-Čösudži (66, 69, 72), Jongak-san (67), Hamhyng (68), Thesöng (70), Džamo-ri (71) and Vönsan (73)

The first combination seems most probable while a theoretical third combination seems rather improbable:

Tachys gradatus gradatus BAT. — North China, Japan

Tachys gradatus coreanus JEDL. — Korea.



Figs. 74, 75. Histograms of the body lengths of Korean (hatched) and Japanese specimens of *Tachys* (*Tachyura*) *gradatus* BAT.; each specimen is marked by one square

On the other hand already at the present stage the taxa "*T. coreanus*", "*T. chinensis*", and "*T. goetzi*" described by JEDLIČKA (1932, 1965b) may be regarded as aberrative forms of *T. gradatus* BAT. since the identification is chiefly based on colour features.

Tachys (*Tachyura*) *fuscicauda* BATES, 1873

Tachys fuscicauda BATES, 1873: 298 (Nagasaki). *Tachys fuscicauda*: ANDREWES, 1925: 438 (Japan; China: Da-laen-saen near Ningpo); NAKANE & al., 1963: 25 (Hokkaido, Honshu, Sikoku, Kyushu, Nansei-Schoto archipelago?); JEDLIČKA, 1965a: 185 (Hiogo, Aomori, Kuzukava, Ningpo).

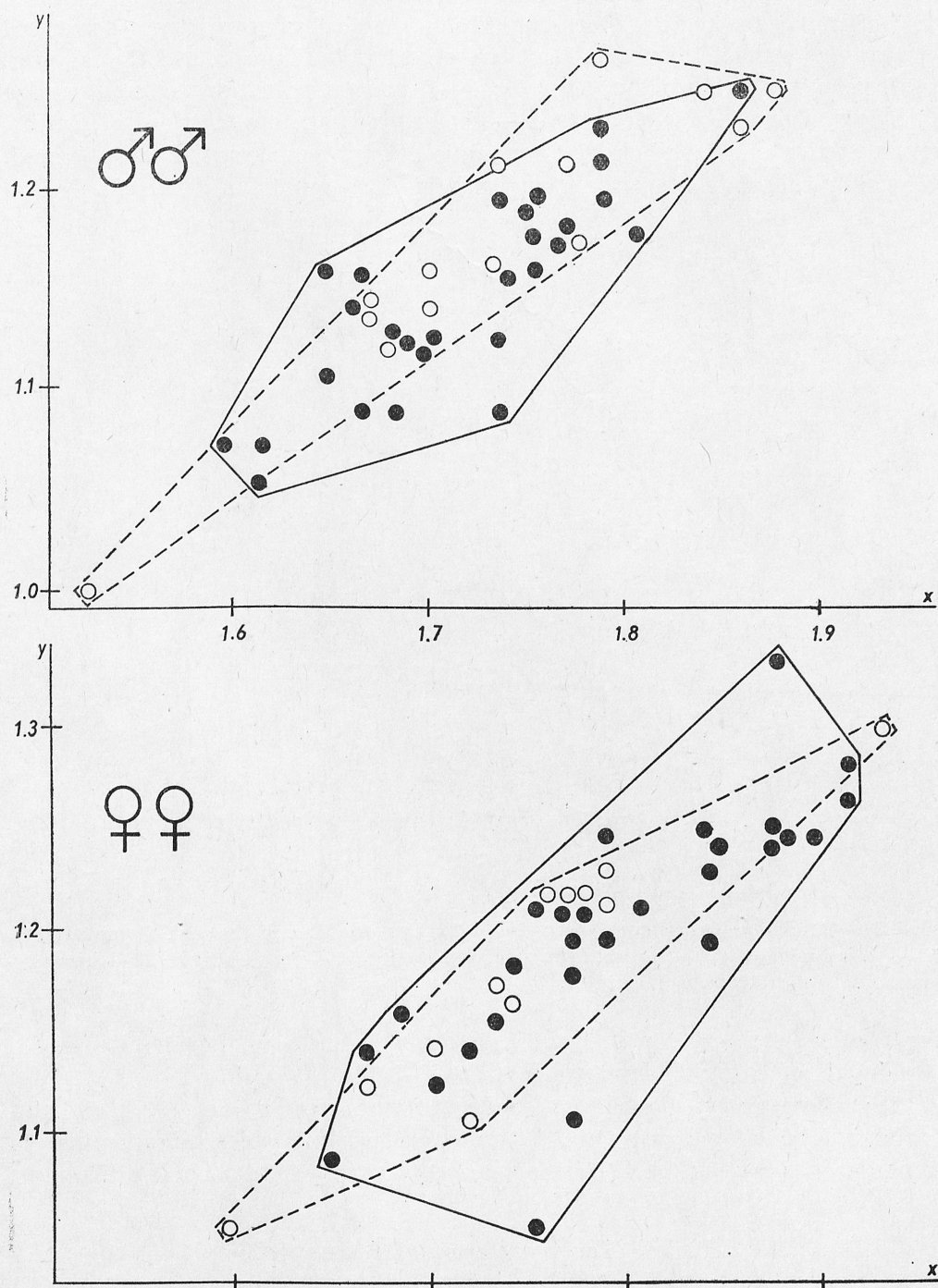
Material examined:

[J] Vönsan, 15 IX 1970, 12 ♂♂, 15 ♀♀ on a beach under seaweed, leg. R. BIELAWSKI & M. MROCZKOWSKI (IZW, ZZS).

[L] Džamo-san Hills above the village Džamo-ri, 27 VIII 1971, 1 ♂, 1 ♀ over a stream leg. A. SZEPTYCKI (ZZS).

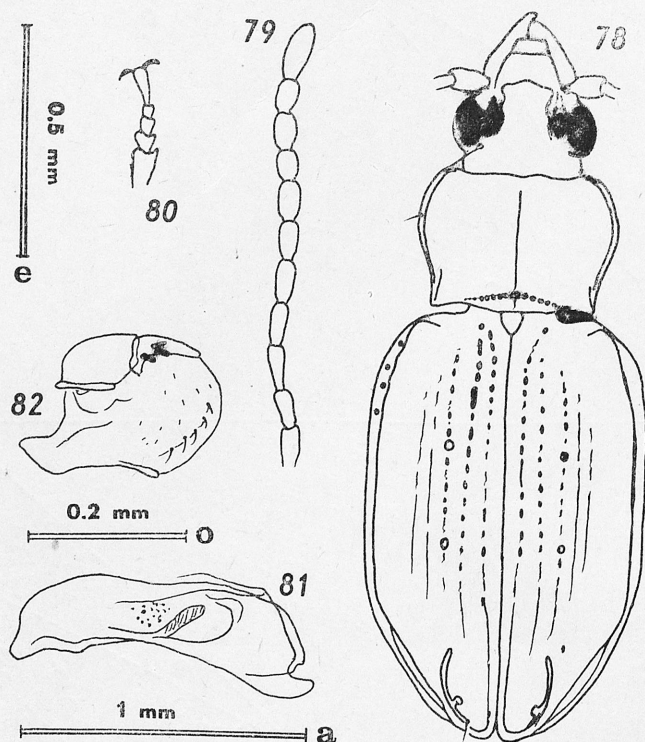
[N] Junha-ri, 13 IX 1970, 1 ♂ leg. R. BIELAWSKI & M. MROCZKOWSKI (IZW).

Description of Korean specimens: body length of males 1.94—2.18 mm, of females 1.97—2.21 mm (ANDREWES, 1925, reports 1.9—2.1 mm; NAKANE & al., 1963, 2 mm; JEDLIČKA, 1965a: 1.9—2.1 mm). Light brown, head and part of



Figs. 76, 77. Dispersion diagrams of the Korean (black circles) and Japanese (open circles) populations of *Tachys (Tachyura) gradatus* BAT.; x — width of elytrae, y — length of elytrae

antennae (joints 3—11) darker; base of antennae, legs, and spots of the back part of elytrae testaceous. Microsculpture on the head very weak, prothorax and elytrae almost wholly smooth. First two elytral striae deep, 3. and 4. shallower, 5, 7 very weak, gradually obsolete; 1—7 punctuate, 8. stria uninterrupted and deep. Dorsal pores on 3. stria — the anterior one on one third of elytrae, the posterior one just behind the middle of elytrae. Recurrent stria bowed, base of apical seta close at the stria just behind the middle of its length. Genital



Figs. 78—82. *Tachys (Tachyura) fuscicauda* BAT.: 78 — habitus of the male from Junha-ri, 79 — its left antenna, 80 — its protarsus of the left foreleg, 81 — its aedocagus; 82 — hemisternum of one female from Vönsan (magnifications: 78 — "a"; 79, 80 — "e"; 81, 82 — "o")

organ of males presented in fig. 81, hemisternal stylus of females in fig. 82, the details of external structure in figs. 78—80.

The above description does not differ from ANDREWES'S (1925) and JEDLIČKA'S (1965a) redescrptions. A comparison with Japanese specimens from JEDLIČKA'S collection (MNP) did not also reveal any fundamental differences.

Tachys (Tachyura) exaratus BATES, 1873

Tachys exaratus BATES, 1873: 296 (Hiogo). *Tachys exaratus*: ANDREWES, 1925: 392 (Japan); NAKANE & al. 1963: 26 (Honshu, Sikoku, Kyushu); JEDLIČKA, 1965a: 170 (Japan); YANO, 1941: 25 (Corea: Fusen-Valley; Honshu, Kyushu; China). *Tachys exaratus* var. *curtus* ANDREWES, 1925: 393 (Japan).

Material examined:

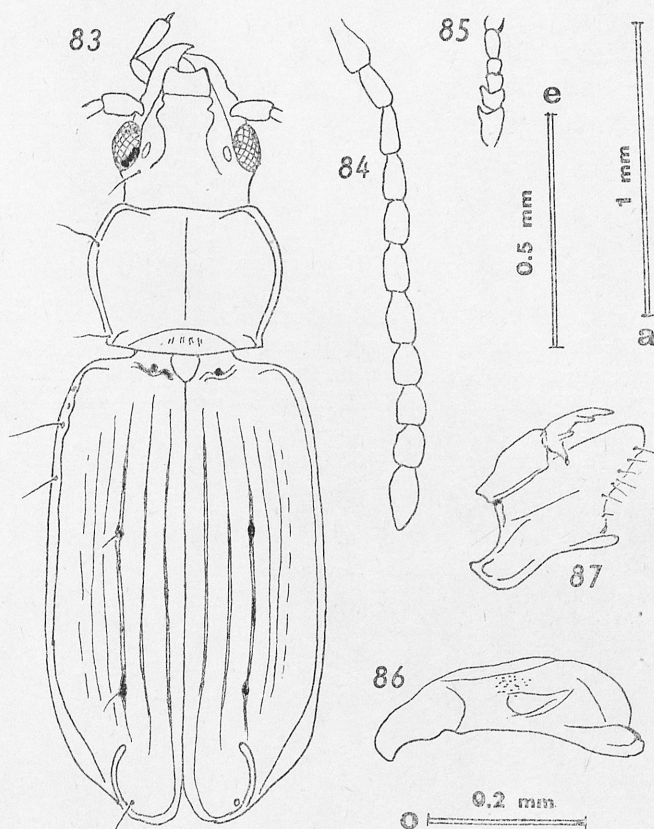
[E] Environs of the village Posŏ-ri, 900 m above sea level, a gravel heap over a right tributary of the River Karim-čhŏn, 11 IX 1971, 3 ♂♂, 3 ♀♀ under stones leg. J. PAWŁOWSKI (ZZS).

[N] Junha-ri, 13 IX 1970, 5 ♂♂, 3 ♀♀ leg. R. BIELAWSKI & M. MROCZKOWSKI (IZW).

[O] Phjŏngjang, a stony and sandy beach over the River Tedong-gang, 29 VII 1971, 8 ♂♂, 3 ♀♀, leg. J. PAWŁOWSKI (ZZS).

[P] Foot of Jongak-san Hills, 16 VIII 1971, 2 ♂♂, 1 ♀ on a loamy bank of the River Sunha-gang leg. J. PAWŁOWSKI (ZZS).

Description of Korean specimens: body length of males 1.80—2.07 mm, of females 1.92—2.27 mm (ANDREWES, 1925, reports 2.2—2.4 mm, these data being repeated by JEDLIČKA, 1965a). Dark brown, palpi, partly legs, and



Figs. 83—87. *Tachys (Tachyura) exaratus* BAT.: 83 — habitus of one female from Posŏ-ri, 84 — its left antenna; 85 — protarsus of right foreleg of one male from Posŏ-ri, 86 — its aedeagus; 87 — hemisternum of one female from Posŏ-ri (magnifications: 83 — "a"; 84, 85 — "e"; 86, 87 — "o")

first joint of antennae yellow brown, second joint of antennae darkened, both 3—11 joints of antennae and femurs strongly darkened, the last joint of antennae weakly lightened. At 60-fold magnification isodiametric slightly erased microsculpture visible on the head and prothorax; on elytrae microsculpture very

indistinct. Three first elytral striae deeply impressed, 4. and 5. shallower, 6. hardly marked, 7. only as a trace, 8. deep in the back, about the middle of elytrae interrupted, in the fore part shallow with indistinct isodiametric microsculpture. Dorsal pores on the 3. stria at about one third of the length of elytrae in the fore- and in the back part. Recurrent stria deep, strongly bent, base of apical seta at the recurrent stria behind the middle of its length. Margins of elytrae and prothorax setulose with very short delicate setulae, visible at 150-fold magnification. Submentum without pores. Fore protarsi of males with dilated and from inside strongly sharpened first two joints (fig. 85). Other details of the external structure presented in figs. 83, 84. The above description corresponds with ANDREWES's redescription (1925) and does not differ from JEDLIČKA's description (1965a).

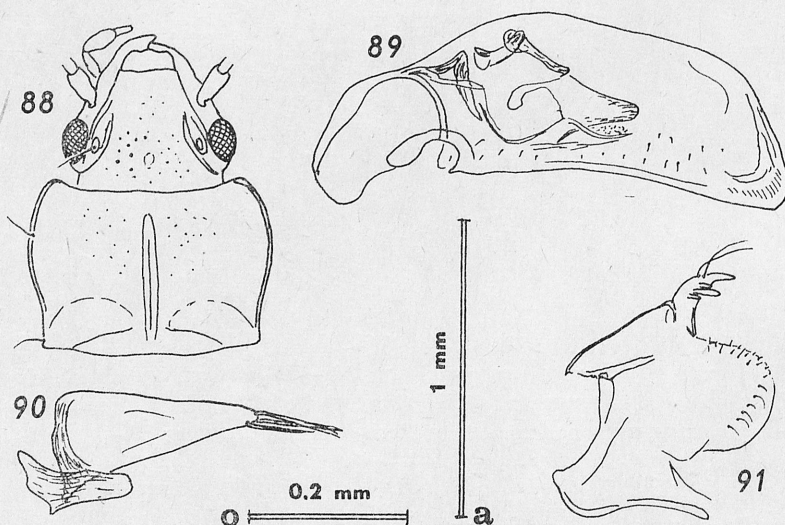
Genital organ of males (fig. 86) with aedoeagus gradually dilating towards the apex, internal sclerites situated in the middle of the length of aedoeagus; left paramere narrow with two long setae at the apex. Hemisternum of females (fig. 87) with long sharp hemisternal stylus armed with two obtuse short setae.

Tachyta nana (GYLLENHAL, 1810)

Tachyta nana: JEDLIČKA, 1965a: 190 (Palaearktische Region bis Japan, Ussuri, Szetschuan); Kryzhanovskij, 1970: 181 (... severnyj Kitaj, Japonia). *Tachys nanus*: ANDREWES, 1925: 486 (Japan, north temperature zone); NAKANE & al., 1963: 26 (Hokkaido, Honshu, Sikoku, Kyushu). *Tachys nunus* (!): YANO, 1941: 25 (Corea: Mt. Baji; Honshu, Formosa: Mt. Ari).

Material examined:

[D] Eastern foot of Mt. Pektu-san, 1700—1800 m above sea level, 6 IX 1971, 2 ♂♂, 1 ♀ under



Figs. 88—91. *Tachyta nana* (GYLL.): 88 — head and prothorax of one male from Pektu-san, 89 — its aedoeagus, 90 — its left paramere; 91 — hemisternum of the female from Pektu-san (magnifications: 88 — “a”; 89—91 — “o”)

the bark of a dead stump in the taiga with *Picea jezoensis* (SIEB. & ZUCC.) CARR. and *Larix dahurica* TURCZ. leg. J. PAWŁOWSKI (ZZS).

[E] The valley of the River Phote-čhôn, 1300 m a.s.l., 7 IX 1971, 1 ♂ under the bark of a log *Salix* sp. in a mixed forest of numerous species, leg. J. PAWŁOWSKI (ZZS).

[G] A valley in the vicinity of the village Dongha-ri, 500—600 m a.s.l. 2 IX 1971, 2 ♀♀ under bark of a log *Salix* sp. leg. J. PAWŁOWSKI (ZZS).

[K] Kymgang-san, 2 VIII 1959, 1 ♂, 1 ♀ leg. B. PISARSKI (IZW).

Korean specimens do not differ in their appearance from specimens known from Europe. Certain details of the external structure, genital organ of male, and hemisternum of female are presented in figs. 88—91.

ECOLOGICAL AND ZOOGEOGRAPHICAL REMARKS

Several distinct ecological groups may be differentiated among Korean *Tachyini*.

1. Halophilous maritime species. All three species of the sub-genus *Tachys* s. str. found in Korea may be classified here: *T. quadrillum* SCHAUM, *T. koreanorum* sp. n., and *T. gyotokuensis sohei* ssp. n. TANAKA (1956) also describes two new species of this sub-genus connected with a saline habitat of the Honsiu

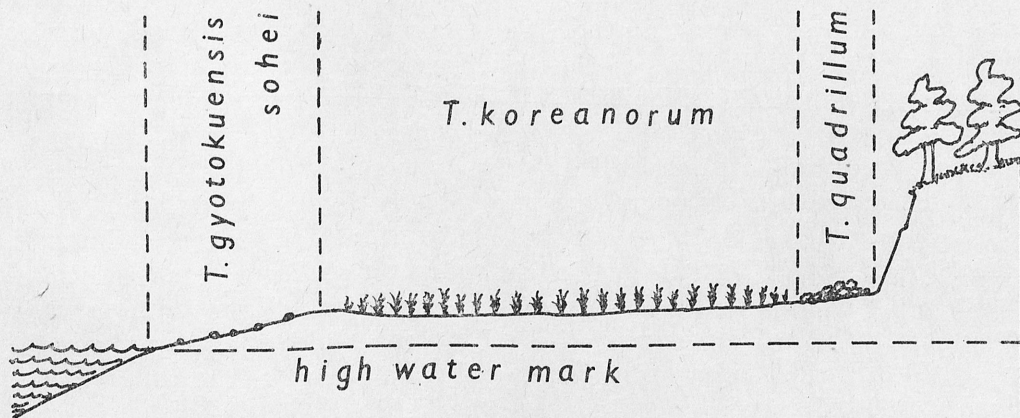


Fig. 92. Scheme of the system of ecological niches of three Korean species of the sub-genus *Tachys* s. str. on the coast of Yellow Sea near Nampho

coast in the region of Tokyo bay. LINDROTH (1966) reports a similar situation from Canada and Alaska where three recorded species of the sub-genus *Tachys* s. str. are also halophilous, however they are not exclusively connected with sea coasts. My observations carried out in the region of Nampho make possible a preliminary determination of the ecological requirements of 3 discussed Korean species. *T. gyotokuensis sohei* ssp. n. occurs under large stones on the coastal part which is often slimed up, just above the line of tides. On higher situated vast halophyte meadows overgrown with *Suaeda maritima* (L.) DUN. *T. koreanorum* sp. n. inhabits cracks of mud thus constituting a part of the community

with *Dichirotrichus coreanus* MLYNÁŘ as a dominant, and with certain representatives of the genera *Bembidion* LATR., *Pogonus* NIC., and *Stenus* LATR. At last stony feet of rocky hills which surround seaside meadows are inhabited by *T. quadrillum* SCHAUM with *Harpalus sinicus* HOPE. The scheme of the system of discussed niches which seem characteristic for the whole western coast of Yellow Sea, is presented in fig. 92. The absence of species from the sub-genus *Tachys* s. str. on the coasts of Japan Sea, where the materials of the first four Polish zoological expeditions were collected (regions of Vönsan, Hamhyng, and Čhôngdžin) is interesting. Those coasts are characterized by the occurrence of rocks and narrow sandy beaches therefore no conditions for the formation of slimy meadows with halophytes occur and only other hygrophilous species were collected there.

2. Species connected with the banks of lowland water courses and water bodies. The most numerous in Korea *Tachys* (*Tachyura*) *gradatus* BAT. and *T. (Tachyura)* *fuscicauda* BAT. may be classified here. They were found as well on the beaches of Japan Sea (Vönsan, Hamhyng), on artificial lakes of the interior (Sökam-Čösudži, Thesöng) as on lowland water courses of various length (the rivers Sunha-gang and Čerjông-gang and streams in the environs of the villages Džamo-ri and Junha-ri). Both species show fairly high tolerance for the type of substratum and occur as well on sandy as on stony banks, and also on loamy and slimy ones; owing to it they are able to live in regions so variable with regard to the landscape. The third species of the sub-genus *Tachyura* MOTSCH., *T. exaratus* BAT. presents still greater versatility; in Korea it is found only at water courses but both in the mountains of the province Janggang-do and in the lowland environs of Phjôngjang, thus it inhabits various types of river banks from stony gravel heaps to sandy beaches and loamy crags.

3. Species of the sub-genus *Elaphropus* MOTSCH.: *T. (E.) latissimus* MOTSCH. and *T. (E.) zouhari* JEDL. occur in lowland parts of Korea near small water courses (streams, spring marshes) and in other wet places even far from water courses, e.g. the last species was collected in a wet mulch near a stream in the village Džamo-ri but also under stones and mats on wet soil in the Botanical Garden in Phjôngjang.

4. Mountain gravel heaps of streams and smaller rivers are inhabited by *Tachys* (*Eotachys*) *dzosonicus* sp. n. found within 500—900 m above sea level in the province Janggang-do. It is accompanied there by the above-mentioned *T. (Tachyura)* *exaratus* BAT. and by a number of species of the genus *Bembidion* LATR.

5. *Tachyta nana* (GYLL.) forms a separate ecological group; this is a species of the ecology fairly known in Europe and North America. Also in Korea it occurs under the bark of decaying and dead trees. In the province Janggang-do I found it as well on coniferous *Larix dahurica* TURCZ., *Picea jezoensis* (SIEB. & ZUCC.) CARR., and on willows (*Salix* sp.?).

Not much may yet be said about the ecological allegiance of *Limnastis yanoi* NAK., *Tachys* (*Eotachys*) *pallescens* BAT., and *T. (E.) varsavianorum* sp. n.

The first two species were caught on artificial water bodies, no certain data being available about the last one (probably caught at the River Tedong-gang). Maybe, it will be possible to classify them all in the second group.

Korean *Tachyini* are a fairly uniform group with regard to zoogeography. Its main part is formed by the Manchurian (i.e. East-Asiatic) element, above all represented by the specimens most common there: *Tachys fuscicauda* BAT.,

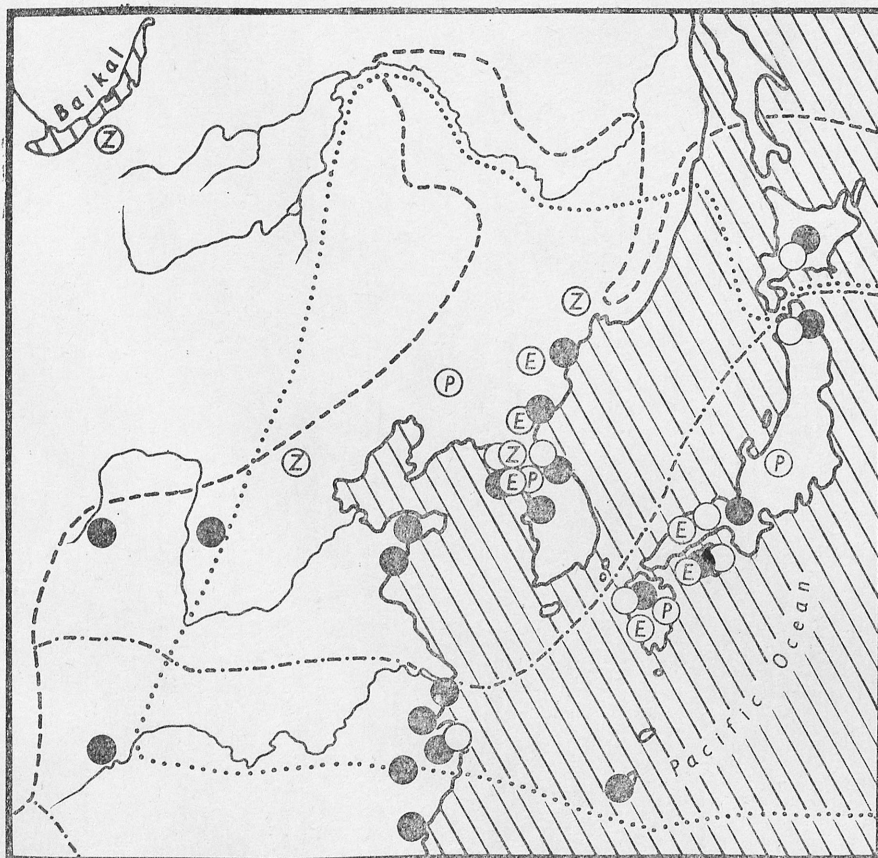


Fig. 93. Known localities of some "Manchurian" species of the genus *Tachys* STEPH.: *T. gradatus* BAT. (black circles), *T. fuscicauda* BAT. (open circles), *T. exaratus* BAT. ("E"), *T. pallescens* BAT. ("P"), *T. zouhari* JEDL. ("Z"); pointed line marks border of Manchurian (East-Asiatic) zoogeographical sub-region after URBAŃSKI (1962); broken line marks border of Chinese-Himalayan zoogeographical sub-region (after VEREŠČAGIN & al., 1964), divided in eastern part in two provinces: Chinese-Korean and Central Chinese-Japanese (border of provinces is marked by broken line with points)

T. exaratus BAT., and *T. gradatus* BAT. Doubtless, in the same zoogeographical group *Lymanastis yanoi* NAK., *Tachys pallescens* BAT., and *T. zouhari* JEDL. may be also classified (see map — fig. 93, and Tab. VIII) and at least some of the lastly described Korean species, however their narrower endemism cannot be wholly excluded: e.g. it seems that *Tachys* (s. str.) *gyotokuensis sohei* ssp. n.

Table VIII

List of *Tachyini* found in the East-Asiatic sub-region

Species or subspecies	Zoogeographical element	China North of 30°N	Korean Peninsula	N. Japan (Hokkaido)	Central Japan
<i>Lymanastis yanoi</i> NAK.	? Manchurian		+		+
<i>Tachys (Polyderis) microscopicus</i> BAT.	Manchurian or endemic Japanese				+
<i>T. (P.) brachys decolor</i> ANDR.	Oriental	+			
<i>T. (Eotachys) pallens</i> BAT.	Manchurian	+	+		+
<i>T. (E.) dzosonicus</i> sp. n.	Manchurian or Chinese-Korean		+		
<i>T. (E.) fasciatus uenoi</i> TAN.	Manchurian or endemic Japanese				+
<i>T. (E.) varsavianorum</i> sp. n.	Manchurian or Chinese-Korean		+		
<i>T. (?E.) koizumi</i> HABU	Manchurian or endemic Japanese				+
<i>T. (Tachys) quadrillum</i> SCHAUM	Oriental		+		+
<i>T. (T.) gyotokuensis gyotokuensis</i> TAN.	endemic Japanese				+
<i>T. (T.) gyotokuensis sohei</i> ssp. n.	Chinese-Korean or endemic Korean		+		
<i>T. (T.) sericans</i> BAT.	Manchurian				+

Species or subspecies	Zoogeographical element	China North of 30°N	Korean Peninsula	N. Japan (Hokkaido)	Central Japan
<i>T. (T.) plagiatus shimosae</i> TAN.	Manchurian or endemic Japanese				+
<i>T. (T.) koreanorum</i> sp. n.	Chinese-Korean or endemic Korean		+		
<i>T. (Elaphropus) latissimus</i> MOTSCH.	Oriental	+	+	+	+
<i>T. (E.) zouhari</i> JEDL.	Manchurian	+	+		
<i>T. (E.) nipponicus</i> HABU & BABA	Manchurian or endemic Japanese				+
<i>T. (Macrotachys) recurvicollis</i> BAT.	Manchurian or endemic Japanese				+
<i>T. (Tachyura) andrewesi</i> JEDL.	? Oriental				+
<i>T. (T.) gradatus</i> BAT.	Manchurian	+	+	+	+
<i>T. (T.) klugi euglyptus</i> BAT.	Manchurian or endemic Japanese				+
<i>T. (T.) exaratus</i> BAT.	Manchurian		+		+
<i>T. (T.) fuscicauda</i> BAT.	Manchurian	+	+	+	+
<i>T. (Sphaerotachys) fumicatus</i> MOTSCH.	Oriental			+	+
<i>Tachyta nana</i> (GYLL.)	Holarctic	+	+	+	+
Number of species:		7	13	5	19
% of total (25) number:		28	52	20	76

is endemic on the coasts of Yellow Sea since similar wide slimy seashores occur on the area of this basin. Out of Manchurian group the most interesting is the finding of *Lymnastis yanoi* NAK. in Korea. In the Asiatic region which is the centre of the dispersion of the genus *Lymnastis* MOTSCH. (JEANNEL, 1929) it is the most northern station of its occurrence (situated on 38°50' N parallel as

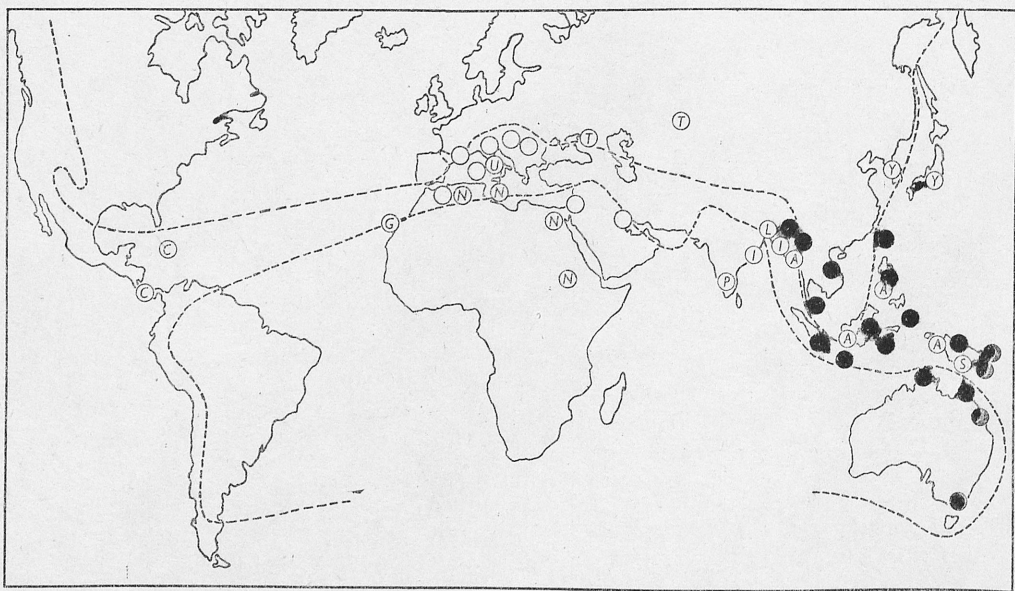


Fig. 94. Distribution of the genus *Lymnastis* MOTSCH.; open circles — *L. galilaeus* BRÜL., black circles — *L. pilosus* BAT., "A" — *L. atricapillus* BAT., "C" — *L. capito* BAT., "G" — *L. gaudini* JEANN., "I" — *L. indicus* MOTSCH., "L" — *L. levatus* ANDR., "N" — *L. niloticus* MOTSCH., "P" — *L. pullulus* MOTSCH., "S" — *L. inops* DARL., "T" — *L. tesquorum* ARN. & KRYZH., "U" — *L. luigionii* DODERO, "Y" — *L. yanoi* NAK.; broken line marks border of late Mesozoic continental platforms (after STRAKHOV, 1948)

latitude, while the Japanese stations on Honsiu do not go beyond 35°N). *Lymnastis* MOTSCH. is an old genus whose representatives inhabit chiefly the coasts of former Tetis from Guatemala to New Guinea (fig. 94), being a classic relict of the period before the development of continents.

From the Holarctic species only *Tachyta nama* (GYLL.) reaches Korea, however it does not reach here its southern line of distribution being noted as far as Taiwan.

It is interesting to observe the occurrence of two oriental species in northern Korea: *Tachys quadrillum* BAT. and *T. latissimus* MOTSCH. The first one reaches its northern line of distribution (Nampho, 38°42'N; fig. 95). It was not as far observed on the well explored Japan Honsiu, this possibly indicating the role of the coastal arm of the current Kuroshivo as the main factor of the distribution of halophilous species in south-east Asia. Probably Indonesia was the centre

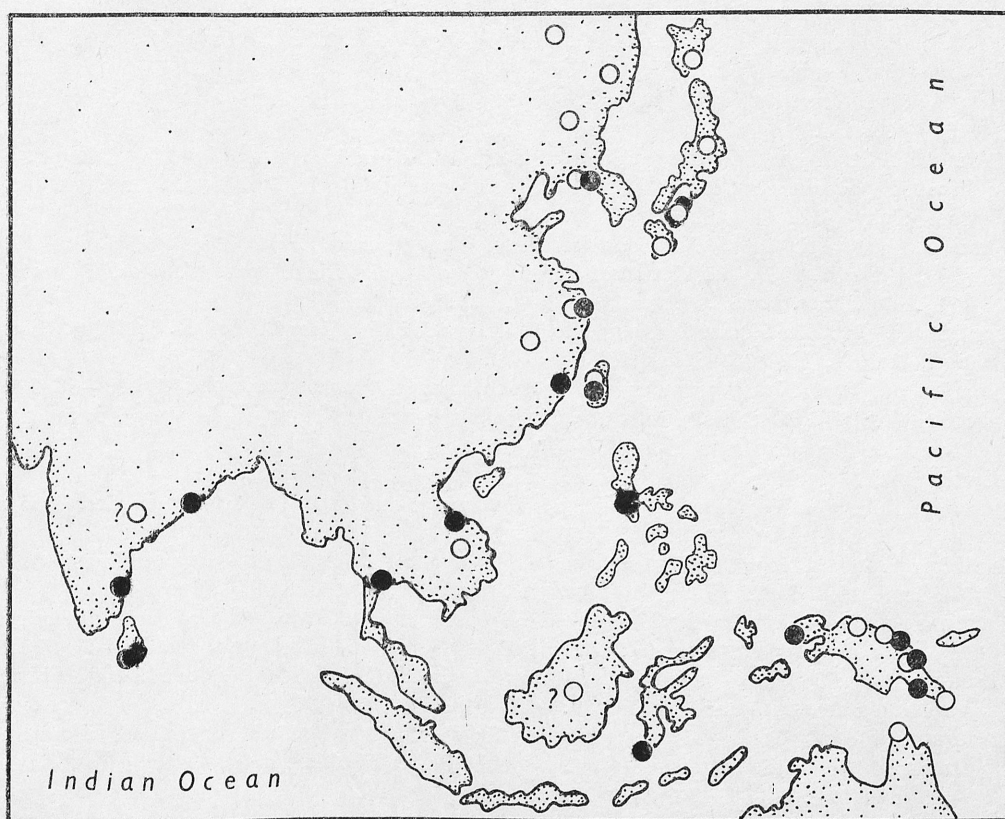


Fig. 95. Distribution of two Oriental species of the genus *Tachys* STEPH.: *T. quadrillum* BAT. (black circles) and *T. latissimus* MOTSCH. (open circles)

of dispersion of *T. quadrillum* SCHAUIM, from where, owing to coastal sea currents, this species reached on the one side Indo-China, India, and Ceylon, and on the other Philippines, China, and western coasts of the Korean peninsula.

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STRESZCZENIE

Autor opracował materiały *Tachyini* zebrane przez 5 polskich ekspedycji zoologicznych do Koreańskiej Republiki Ludowo-Demokratycznej w latach 1959—1971. Wśród 168 okazów autor stwierdził 13 gatunków, z których 4 opisuje

jako nowe taksony. Są to: *Tachys (Eotachys) dzosonicus* sp. n., *T. (E.) varsavianorum* sp. n., *T. (Tachys) gyotokuensis sohei* ssp. n. i *T. (T.) koreanorum* sp. n. Z pozostałych, 6 wykazuje po raz pierwszy z Półwyspu Koreańskiego, przy czym *Lymnastis yanoi* NAK. i orientalny *Tachys (T.) quadrillum* SCHAUM osiągają w Korei północną granicę zasięgu. W wyniku rewizji materiałów muzealnych oraz zebranych przez polskie ekspedycje, autor proponuje uznanie nazw: *Tachys chinensis* JEDL., *T. coreanus* JEDL. i *T. goetzi* JEDL. za synonimy *Tachys (Tachyura) gradatus* BAT.

Pracę uzupełniają klucz do oznaczania koreańskich *Tachyini* oraz uwagi ekologiczne u zoogeograficzne.

РЕЗЮМЕ

Настоящая работа, являющаяся обзором 13 видов трибы *Tachyini*, основана на результатах 5 польских зоологических экспедиций в Корею (1959—1971). Из этого материала (168 экземпляров) автор описывает 4 новые таксоны: *Tachys (Eotachys) dzosonicus* sp. n., *T. (E.) varsavianorum* sp. n., *T. (Tachys) gyotokuensis sohei* ssp. n., *T. (T.) koreanorum* sp. n. Шесть других видов впервые указывается для корейского полуострова, при этом *Lymnastis yanoi* NAK. и ориентальный *Tachys (Tachys) quadrillum* SCHAUM достигают здесь северную границу распространения. В результате обработки экспедиционных и доступных музейных материалов автор считает таксоны: *Tachys chinensis* JEDL., *T. coreanus* JEDL., *T. goetzi* JEDL. синонимами вида *Tachys (Tachyura) gradatus* BAT.

Работу дополняет ключ для определения корейских видов трибы *Tachyini* а также экологическое и зоогеографическое замечания.

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