

The *Tetrigidae* (Orthoptera) found in North Korea

Dariusz KOSTIA

Received: 25 Aug. 1995

Accepted for publication: 15 Nov. 1995

KOSTIA D. 1995. The *Tetrigidae* (Orthoptera) found in North Korea. Acta zool. cracov., **38**(2): 257-265.

Abstract. A list of species, drawings, and a key to genera and species of *Tetrigidae* found in North Korea are given. The male of *Formosatettix slivae* KOSTIA is described.

Key words: *Tetrigidae*, key, description, North Korea.

Dariusz KOSTIA, Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, ul. Sławkowska 17, 31-016 Kraków, Poland.

The *Tetrigidae* of North Korea are almost completely unknown. Recently one new species belonging to the genus *Formosatettix* TINKHAM was described from the northern part of the country (KOSTIA 1993). The present paper is based not only on materials collected by the author and scientists from the Institute of Systematics and Evolution of Animals during several expeditions to North Korea but also on other materials obtained from the institutions listed below. Abbreviations for depositories used throughout the text are given below together with the names of collectors.

ISEA – Institute of Systematics and Evolution of Animals, Cracow, Poland.

1989 – E. WARCHAŁOWSKA; 1990 – D. KOSTIA, A. NADACHOWSKA, E. WARCHAŁOWSKA;

1991 – J. PAWŁOWSKI, E. STWORZEWICZ, T. TOMEK; 1992 – D. KOSTIA, E. WARCHAŁOWSKA

MNHB – Museum of Natural History, Budapest, Hungary.

1970 – S. MAHUNKA, H. STEINMANN; 1971 – S. HORVATOVICH, J. PAPP

ZIS – Zoological Institute, Sofia, Bulgaria.

1970, 1973 – G. P. PESHEV

ZIW – Zoological Institute, Warsaw, Poland.

1965 – M. MROCZKOWSKI, A. RIEDEL; 1966 – C. DZIADOSZ, H. SZEŁĘGIEWICZ;

1970 – R. BIELAWSKI, M. MROCZKOWSKI

A c k n o w l e d g m e n t s. The author is very grateful to the following scientists who kindly lent the materials: Dr. A. LIANA, Dr. L. L. PODGORNAYA, Dr. A. V. GOROCHOV, Dr. G. P. PESHEV, and Dr. G. SZIRÁKI. Sincere thanks are also due to Dr. T. TOMEK, for her invaluable help in locating and translating names of some collecting localities from Korean to English.

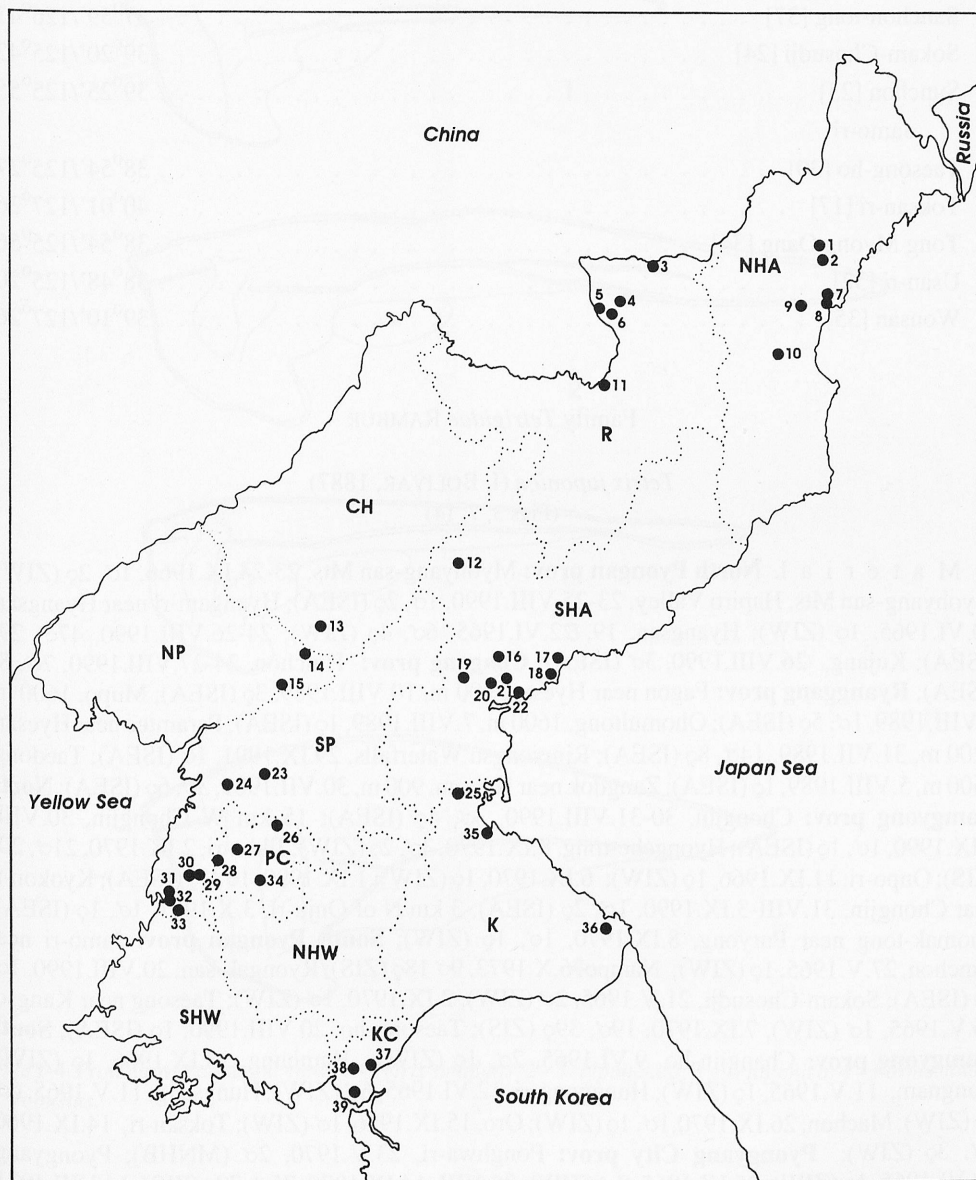
Collecting localities

Most names of collecting localities and provinces as well as the current division of North Korea are given according to the English version of the map of the Korean Peninsula issued by Map

Publishing House, DPRK, Pyongyang 1986. Some places could only be found in the Korean version of the map. In that case they were translated into English according to rules given by MROCZKOWSKI (1972). Indented localities could not be found on either the English or Korean version of the map, therefore they are placed under the closest locality available. Numbers in square brackets refer to the situation of the locality on the map.

List of collecting localities.

| | |
|--|----------------|
| Changjin-ho [12] | 40°30'/127°12' |
| Chongjin [8] | 41°47'/129°45' |
| Kyokon-ri | |
| Chonnae [25] | 39°22'/127°13' |
| Hamhung [21] | 39°55'/127°33' |
| Huichon [13] | 40°10'/126°17' |
| Hungnam [22] | 39°50'/127°39' |
| Hungpong-ri [19] | 39°55'/127°16' |
| Hungsang [20] | 39°53'/127°26' |
| Hyangsan [14] | 40°02'/126°12' |
| Hyangam-ri | |
| Hyesan [11] | 41°24'/128°12' |
| Fagon, Paramtec, Zangdok | |
| Hyongche-tong [2] | 42°00'/129°44' |
| Jikha-ri [7] | 41°49'/129°48' |
| Kaesong [38] | 37°58'/126°34' |
| Kangso [29] | 38°54'/125°19' |
| Taesong | |
| Kujang [15] | 39°52'/126°02' |
| Machon [18] | 39°55'/127°50' |
| Mangyongdae [28] | 38°59'/125°38' |
| Mupo [3] | 42°00'/128°33' |
| Myohyang-san Mts | |
| Hapiro Valley, Manpok Valley, Sangvon Valley, Sangwon-am | |
| Nampo [33] | 38°45'/125°23' |
| Ohomultong [5] | 41°46'/128°08' |
| Onju-ri [9] | 41°47'/129°35' |
| Onpo-ri [10] | 41°32'/129°25' |
| Onyong-ri [36] | 38°41'/128°12' |
| Oro [16] | 40°02'/127°29' |
| Pakyon Mts [39] | 37°51'/126°35' |
| Ponghwa-ri [26] | 39°10'/126°01' |
| Puryong [1] | 42°03'/129°42' |
| Thomak-tong | |
| Pyongyang [27] | 39°02'/125°45' |
| Mt. Moranbong | |



Map 1. Situation of collecting localities in North Korea. Numbers mark the localities specified in the list. Capital letters denote abbreviated names of provinces: NP – North Pyongan, CH – Chagang, R – Ryanggang, NHA – North Hamgyong, SP – South Pyongan, SHA – South Hamgyong, PC – Pyongyang City, SHW – South Hwanghae, NHW – North Hwanghae, K – Kangwon.

| | |
|------------------------------------|----------------|
| Rimyongsu Waterfalls [6] | 41°45'/128°16' |
| Ryongak-san [31] | 38°50'/125°20' |
| Samjiyon [4] | 41°48'/128°19' |
| Sanchon-tong [37] | 37°59'/126°41' |
| Sokam-Chosudji [24] | 39°20'/125°42' |
| Sunchon [23] | 39°25'/125°55' |
| Jamo-ri | |
| Taesong-ho [30] | 38°54'/125°27' |
| Toksan-ri [17] | 40°01'/127°36' |
| Tong Myong Oang [34] | 38°54'/125°56' |
| Usan-ri [32] | 38°48'/125°20' |
| Wonsan [35] | 39°10'/127°26' |

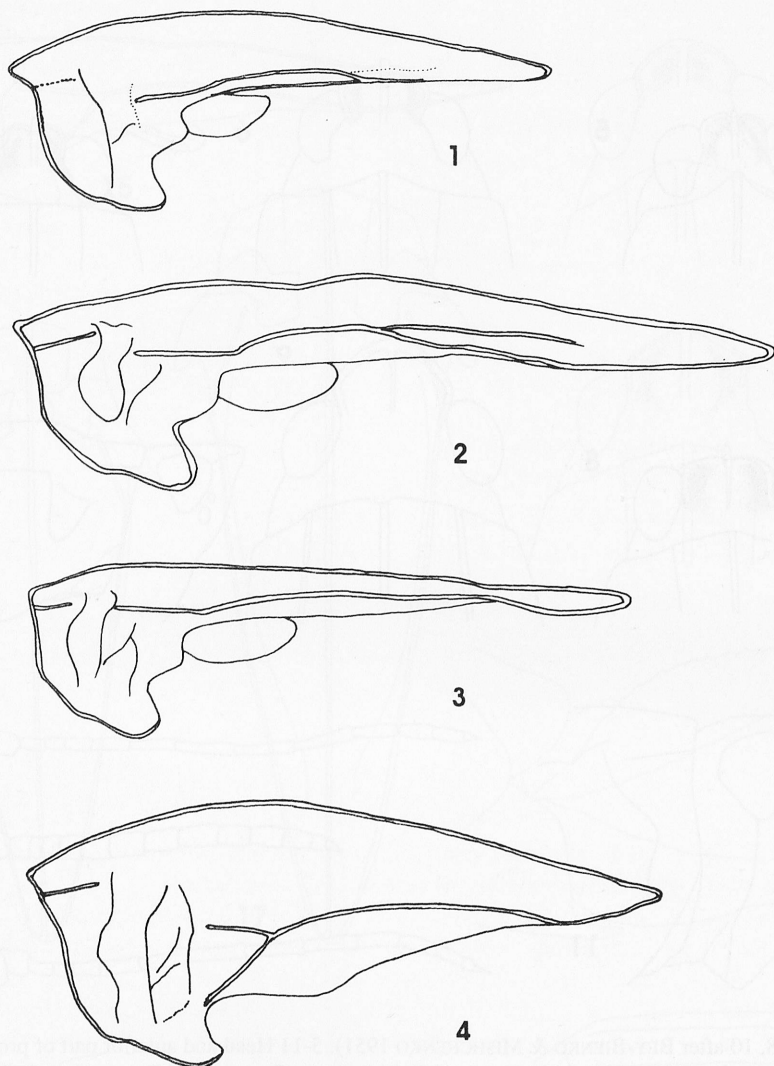
Family *Tetrigidae* RAMBUR

Tetrix japonica (I. BOLIVAR, 1887)

(Figs 3, 7, 14)

M a t e r i a l. **North Pyongan prov:** Myohyang-san Mts, 23-24.IX.1966, 1♂, 2♀ (ZIW); Myohyang-san Mts, Hapiro Valley, 23-25.VIII.1990, 1♂, 2♀ (ISEA); Hyangam-ri near Hyangsan, 20.VI.1965, 1♀ (ZIW); Hyangsan, 19, 22.VI.1965, 6♂, 4♀ (ZIW); 24-26.VIII.1990, 47♂, 29♀ (ISEA); Kujang, 26.VIII.1990, 3♂ (ISEA); **Chagang prov:** Huichon, 24-27.VIII.1990, 7♂, 8♀ (ISEA); **Rygang prov:** Fagon near Hyesan, 900 m, 10.VIII.1989, 3♀ (ISEA); Mupo, 1600 m, 5.VIII.1989, 1♂, 5♀ (ISEA); Ohomultong, 1600 m, 7.VIII.1989, 1♀ (ISEA); Paramtec near Hyesan, 1200 m, 31.VII.1989, 14♂, 8♀ (ISEA); Rimyongsu Waterfalls, 29.IX.1991, 1♂ (ISEA); Taedong, 1600 m, 5.VIII.1989, 1♀ (ISEA); Zangdok near Hyesan, 900 m, 30.VII.1989, 3♂, 6♀ (ISEA); **North Hamgyong prov:** Chongjin, 30-31.VIII.1990, 3♂, 4♀ (ISEA); 15 km W Chongjin, 30.VIII-3.IX.1990, 1♂, 1♀ (ISEA); Hyongche-tong, 8.IX.1970, 3♂, 2♀ (ZIW); Jikha-ri, 2.IX.1970, 21♂, 20♀ (ZIS); Onpo-ri, 11.IX.1966, 1♀ (ZIW); 6.IX.1970, 1♀ (ZIW); 1.IX.1990, 1♂, 1♀ (ISEA); Kyokon-ri near Chongjin, 31.VIII-3.IX.1990, 1♂, 2♀ (ISEA); 3 km N of Onju-ri, 3.X.1991, 1♂, 1♀ (ISEA); Thomak-tong near Puryong, 8.IX.1970, 1♂, 1♀ (ZIW); **South Pyongan prov:** Jamo-ri near Sunchon, 27.V.1965, 1♀ (ZIW); Nampo, 6.X.1973, 9♂ 18♀ (ZIS); Ryongak-san, 20.VIII.1990, 1♂, 3♀ (ISEA); Sokam-Chosudji, 21.V.1965, 2♂ (ZIW), 2.IX.1970, 1♂ (ZIW); Taesong near Kangso, 26.V.1965, 1♂ (ZIW), 7.IX.1970, 19♂, 39♀ (ZIS); Taesong-ho, 20.VIII.1990, 1♀ (ISEA); **South Hamgyong prov:** Changjin-ho, 9.VI.1965, 2♂, 1♀ (ZIW); Hamhung, 13.IX.1966, 1♀ (ZIW); Hungnam, 11.V.1965, 1♀ (ZIW); Hungpong-ri, 12.VI.1965, 6♂ (ZIW); Hungsang, 11.V.1965, 6♂, 7♀ (ZIW); Machon, 26.IX.1970, 1♂, 1♀ (ZIW); Oro, 15.IX.1966, 1♂ (ZIW); Toksan-ri, 14.IX.1966, 8♂, 3♀ (ZIW); **Pyongyang City prov:** Ponghwa-ri, 23.V.1970, 2♂ (MNHB); Pyongyang, 19.VI.1965, 1♀ (ZIW), 25.VI.1965, 2♂ (ZIW), 26.VIII.14.IX.1970, 75♂, 70♀ (ZIS), 14.VIII.1971, 2♂ (MNHB); Pyongyang, Mt. Moranbong, 27.VIII.1970, 2♀ (ZIW); Mangyongdae, 31.VIII.1970, 1♀ (ZIW); Tong Myong Oang, 6-7.IX.1990, 2♂, 3♀ (ISEA); **Kangwon prov:** Chonnae, 10.VI.1965, 3♂ (ZIW); Chonsam-ri – 10 km S of Wonsan, 3.IX.1966, 2♂ (ZIW); Onyong-ri, 8-12.IX.1990, 3♂, 2♀ (ISEA); Ungchin – 25 km S of Wonsan, 18.IX.1970, 1♀ (ZIW); Wonsan, 31.VIII.1966, 2♀ (ZIW), 28.V.1970, 1♂, 1♀ (MNHB); **Kaesong City prov:** 20 km N Kaesong, 15-16.IX.1990, 9♂, 5♀ (ISEA); Pakyon Mts, 27.VIII.1966, 1♀ (ZIW); Sanchon-tong, 7-8.VI.1970, 5♂, 4♀ (MNHB).

Measurements (in mm): body ♂ 7.7-9.3 (11.4-12.5), ♀ 8.9-12.3 (12.6-14.5); hind femur ♂ 5.5-5.9, ♀ 6.1-7.6; ovipositor 1.4-1.7.

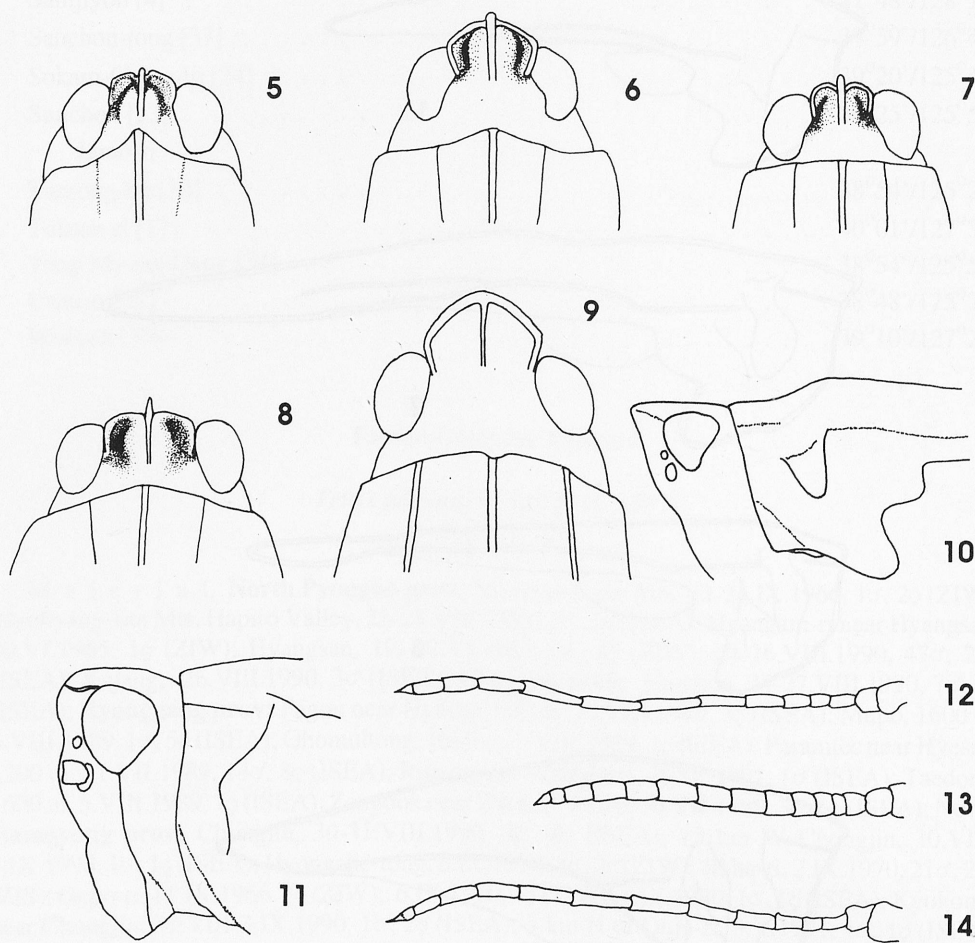


Figs 1-4. Pronotum of σ , lateral view. 1 – *Tetrix simulans*; 2 – *T. bipunctata*; 3 – *T. japonica*; 4 – *Formosatettix robustus*.

Tetrix bipunctata (LINNAEUS, 1758)
(Figs 2, 6, 13)

Material. **Ryanggang prov:** Samjiyon, 16.VI.1990, 2♀ (H. S. Ring; ISEA); 18-25.VIII.1992, 2♂ (ISEA).

Measurements (in mm): body σ 10.5, ♀ 12.1-12.8; hind femur σ 5.9-6.2, ♀ 6.9-7.1; ovipositor 1.6-2.



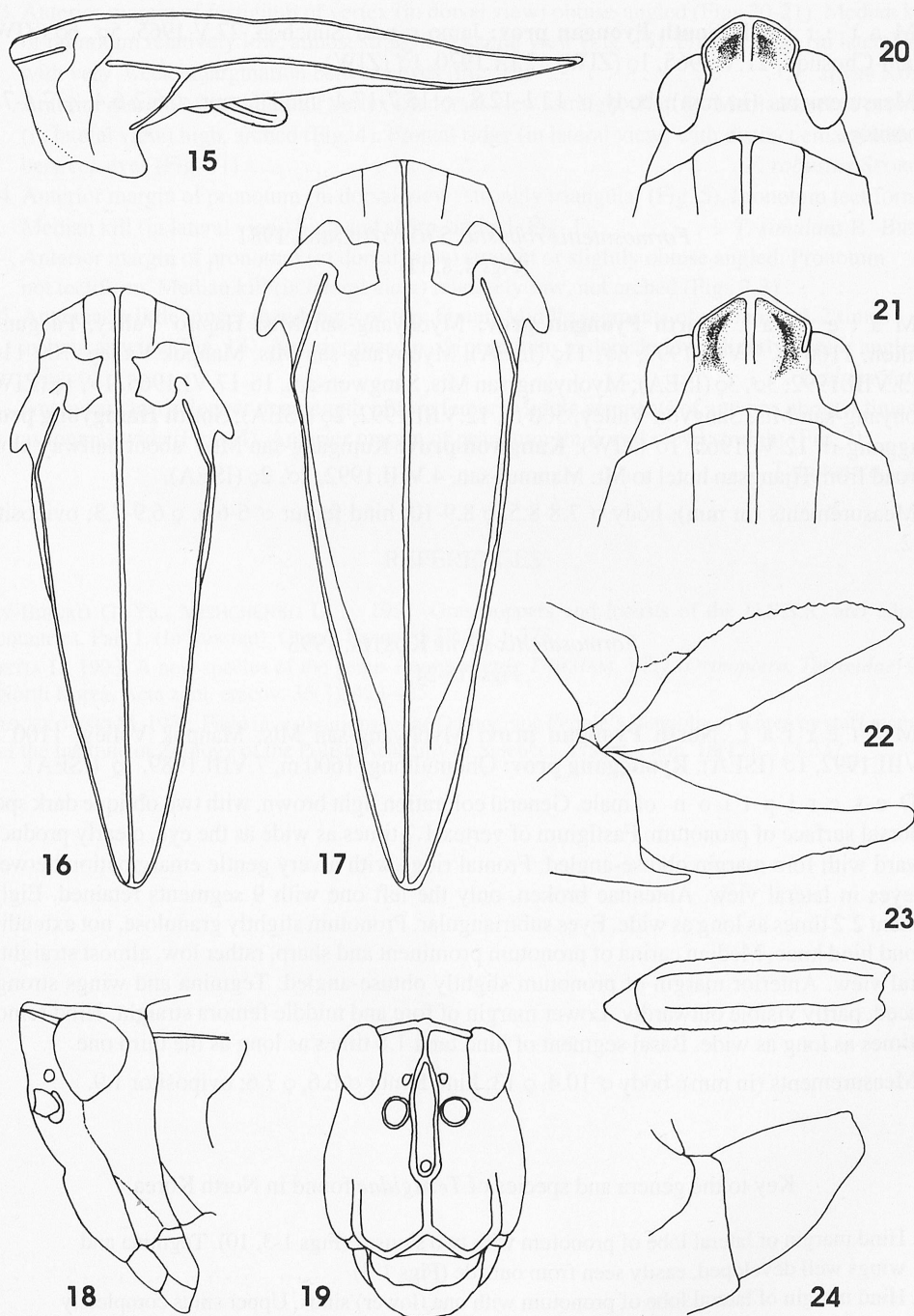
Figs 5-14. (8, 10 after BEY-BIENKO & MISHCHENKO 1951). 5-11 Head and anterior part of pronotum. 5 – ♂ of *Tetrix simulans*, dorsal view; 6 – same of *T. bipunctata*; 7 – same of *T. japonica*; 8 – same of ♂ of *Formosatettix robustus*; 9 – same of ♀ of *Clinotettix ussuriensis*; 10 – same of ♀ of *C. ussuriensis*, lateral view; 11 – same of ♂ of *F. robustus*; 12-14 Antennae of ♂, dorsal view. 12 – *T. simulans*; 13 – *T. bipunctata*; 14 – *T. japonica*.

Tetrix simulans (BEY-BIENKO, 1929)

(Figs 1, 5, 12)

Material. North Hamgyong prov: Onpo-ri, 1.X.1970, 1♀ (ZIS); Pyongyang City prov: Tong Myong Oang, 6-7.IX.1990, 2♂, 7♀ (6 larvae) (ISEA).

Measurements (in mm): body ♂ 7.3-7.4, ♀ 7.9; hind femur ♂ 5-5.1, ♀ 5.4; ovipositor 1.4.



Figs 15-24. *Formosatettix slivae*. 15 – pronotum of σ , lateral view; 16 – same, dorsal view; 17 – same of ϕ ; 18 – head of σ , lateral view; 19 – same, frontal view; 20 – same, dorsal view; 21 – same of ϕ ; 22 – ovipositor, lateral view; 23 – middle femur of σ , lateral view; 24 – subgenital plate of σ , lateral view.

Clinotettix ussuriensis BEY-BIENKO, 1933

(Figs 9-10)

Material. **South Pyongan prov:** Jamo-ri near Sunchon, 27.V.1965, 5♂, 6♀ (ZIW); Sokam-Chosudji, 21.V.1965, 1♀ (ZIW); 2.IX.1970, 1♂ (ZIW).

Measurements (in mm): body ♂ 12.1-12.8, ♀ 15.7-17.4; hind femur ♂ 6.2-6.4, ♀ 7.4-7.7; ovipositor .

Formosatettix robustus STOROZHENKO, 1981

(Figs 4, 8, 11)

Material. **North Pyongan prov:** Myohyang-san Mts, Hapiro Valley, Paegun-te Pavilion, 1100 m, 9.VIII.1992, 8♂, 11♀ (ISEA); Myohyang-san Mts, Manpok Valley, 700-1100 m, 13.VIII.1992, 3♂, 3♀ (ISEA); Myohyang-san Mts, Sangwon-am, 16-17.VI.1965, 1♂, 1♀ (ZIW); Myohyang-san Mts, Sangvon Valley, 500 m, 12.VIII.1992, 2♀ (ISEA); **South Hamgyong prov:** Hungpong-ri, 12.VI.1965, 1♂ (ZIW); **Kangwon prov:** Kumgang-san Mts, about halfway along the road from Hjangsan hotel to Mt. Manmul-san, 4.VIII.1992, 2♂, 2♀ (ISEA).

Measurements (in mm): body ♂ 7.8-8.5, ♀ 8.9-10; hind femur ♂ 6-6.6, ♀ 6.9-7.3; ovipositor 1.9-2.

Formosatettix slivae KOSTIA, 1993

Figs (15-24)

Material. **North Pyongan prov:** Myohyang-san Mts, Manpok Valley, 1100 m, 13.VIII.1992, 1♂ (ISEA); **Ryanggang prov:** Ohomultong, 1600 m, 7.VIII.1989, 1♀ (ISEA).

Description of male. General coloration light brown, with two oblique dark spots on dorsal surface of pronotum. Fastigium of vertex 1.7 times as wide as the eye, clearly produced forward with fore margin obtuse-angled. Frontal ridge with a very gentle emargination between the eyes in lateral view. Antennae broken, only the left one with 9 segments retained. Eighth segment 2.2 times as long as wide. Eyes subtriangular. Pronotum slightly granulose, not extending beyond hind knee. Median carina of pronotum prominent and sharp, rather low, almost straight in lateral view. Anterior margin of pronotum slightly obtuse-angled. Tegmina and wings strongly reduced, partly visible outwardly. Lower margin of fore and middle femora straight. Hind femora 3.3 times as long as wide. Basal segment of hind tarsi 1.8 times as long as the third one.

Measurements (in mm): body ♂ 10.4, ♀ 13; hind femur ♂ 6.6, ♀ 7.6; ovipositor 1.9.

Key to the genera and species of *Tetrigidae* found in North Korea

1. Hind margin of lateral lobe of pronotum with two sinuses (Figs 1-3, 10). Tegmina and wings well developed, easily seen from outside (Figs 1-3) 2
- Hind margin of lateral lobe of pronotum with one (lower) sinus. Upper sinus completely or almost completely absent (Figs 4, 15). Tegmina and hind wings strongly reduced or absent, entirely covered by pronotum or partly visible from outside (Fig. 15) (*Formosatettix* TINKH.) 3
2. Vertex between eyes moderately projecting anteriorly (Figs 5-7). Frons (in lateral view) almost perpendicular or slightly inclined. (*Tetrix* LATR.) 4

- . Vertex between eyes strongly projecting anteriorly (Fig. 9). Frons (in lateral view) clearly inclined, forming an acute angle with vertex (Fig. 10) *Clinotettix ussuriensis* B.-BIENKO
- 3. Anterior margin of fastigium of vertex (in dorsal view) obtuse-angled (Figs 20-21). Median keel of pronotum relatively low, almost straight in lateral view (Fig. 15). Frontal ridge (in lateral view) with very weak emargination between eyes (Fig. 18) *F. slivae* KOSTIA
- . Anterior margin of fastigium of vertex (in dorsal view) straight (Fig. 8). Median keel of pronotum (in lateral view) high, arched (Fig. 4). Frontal ridge (in lateral view) with distinct emargination between eyes (Fig. 11) *F. robustus* STOROZH.
- 4. Anterior margin of pronotum (in dorsal view) strongly triangular (Fig. 5). Pronotum tectiform. Median keel (in lateral view) high and sharp, arched (Fig. 1) *T. simulans* B.-BIENKO
- . Anterior margin of pronotum (in dorsal view) straight or slightly obtuse angled. Pronotum not tectiform. Median keel (in lateral view) relatively low, not arched (Figs 2-3) 5
- 5. Antennae a little longer than length of fore femur. Middle segments of antenna 1.5-2 times as long as wide (Fig. 13). Anterior margin of (pronotum in dorsal view) slightly obtuse angled (Fig. 6) *T. bipunctata* L.
- . Antennae clearly longer than length of fore femur. Middle segments of antenna about 4 times as long as wide (Fig. 14). Anterior margin of pronotum (in dorsal view) straight (Fig. 7) *T. japonica* I. BOL.

REFERENCES

- BEY-BIENKO G. Ya., MISHCHENKO L. L. 1951. Grasshoppers and locusts of the U.S.S.R. and adjacent countries. Part 1. (In Russian). *Opred. Faune SSSR* **38**: 1-378.
- KOSTIA D. 1993. A new species of the genus *Formosatettix* TINKHAM, 1937 (*Orthoptera, Tetrigidae*) from North Korea. *Acta zool. cracov.* **35**(3): 423-425.
- MROCKZOWSKI M. 1972. Field investigations in the Democratic People's Republic of Korea by staff members of the Institute of Zoology of the Polish Academy of Sciences. *Fragm. Faun.* **18**(17): 313-337.

