

## **Taxonomic Study of Parholaspid Mites (Acari, Mesostigmata) in Korea**

**Won-Koo Lee and So Young Lee**

(Department of Biology, College of Natural Sciences, Chonbuk National University,  
Chonju, 561-756, Korea)

### **ABSTRACT**

Mesostigmatid mites were collected from forest soils in Korea from December 1998 to October 1999. Eleven species were recognized including a new species, *Neparholaspis bisunensis* n. sp., and three new records, *Holaspina communis* (Ishikawa, 1966), *Holaspina multidentatus* (Ishikawa, 1980) and *Holaspulus montanus* Ishikawa, 1995.

Key words: Parholaspidae, Mesostigmata, soil mites, taxonomy, Korea

### **INTRODUCTION**

Mesostigmatid mites are found in various forest soil habitats. In Korea. Since Paik's (1983) first reported *Gamasholaspis akimotoi*, *G. asiaticus*, *G. communis* and *Holaspulus serratus*. Choi (1994) added *Parholaspulus ochraceus* and *Euparholaspulus primoris*. Subsequently, Lee and Lee (1996) reported *Holaspina alstoni*, *H. shigaensis* and *H. trifurcatus* and Lee and Lee (1996) reported *Gamasholaspis browningi* and *Holaspia dentatus* from Korea.

Recently, Kwon and Lee (1999) studied on ecology of soil microarthropods at the Gaya Mountain National Park and found *H. ochraceus* as the most abundant mite.

This study was carried out to understand the Korean fauna of free living mesostigmatid mites in soil. Mites were collected from December 1998 to October 1999. They were sorted out from the sampled soil through Tullgren funnels and preserved in 75% alcohol. The specimens were treated

---

The present study was supported by the Basic Research Institute Program, Ministry of Education, 1998, project no. BSRI-1998-015-D00229.

with 50% lactic acid at 60°C and mounted on PVA medium.

As a result, 11 species of mites are identified.

## TAXONOMIC ACCOUNTS

Genus *Gamasholaspis* Berlese, 1904 창응애속(신칭)

### 1. *Gamasholaspis browningi* (Bregetova et Koroleva, 1960) 갈색창응애

*Evansolaspis browningi* Bregetova and Korileva, 1960, 32.

*Gamasholaspis browningi*: Ehara, 1980, p. 76. fig. 26; Lee and Lee, 1996, p. 131, fig. 1.

**Material examined.** 2 ♀♀, Daedunsan, Chonbuk, 10 Jul. 1999; 6 ♀♀, Sokrisan, Chungnam, 8 Dec. 1998; 1 Deutonymph, Chiaksan, Kangwon, 24-Aug. 1999.

**Distribution.** Japan, Russia, Korea.

Genus *Holaspina* Berlese, 1916 두루창응애속(신칭)

### 2. *Holaspina alstoni* (Evans, 1956) 알스톤창응애 (신칭)

*Parholaspulus alstoni* Evans, 1956, p. 374, figs. 61-64; Ehara, 1980, p. 83; Kranz, 1960, p. 417.

*Holaspina alstoni*; Farrier et Hennessey, 1993, p. 105; Lee et Lee, 1996, p. 25; Kwon et Lee, 1999, p. 37.

**Material examined.** 2 ♀♀, Yongkwang, Chonnam, 28 Jun. 1999; 1 ♀, Chonju, Chonbuk, 6 Jul. 1999; 2 ♀♀, Ulingdo Is., Kyongbuk, 15 Jun. 1999; 5 ♀♀, Bosung, Chonnam, 31 Dec. 1998

**Distribution.** England, North America, Japan, Korea.

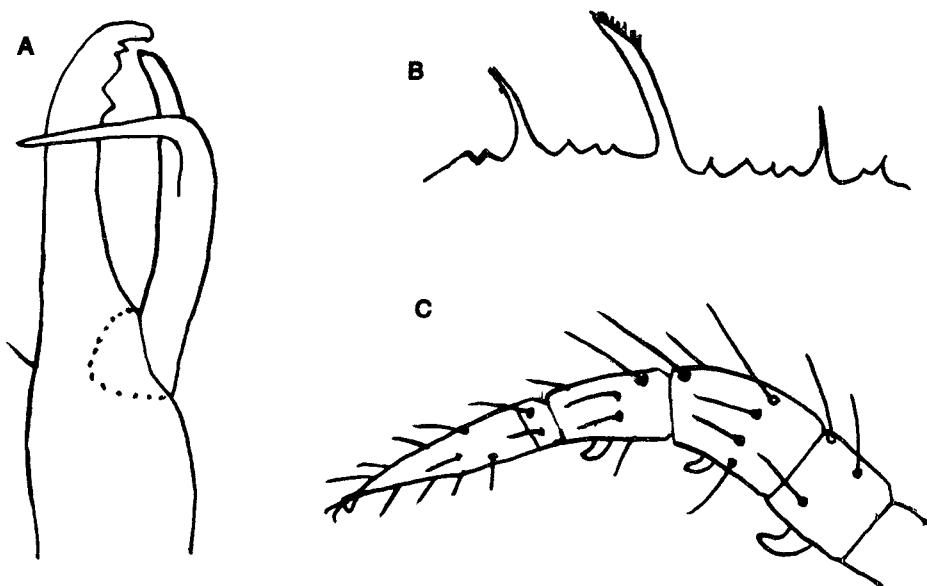


Fig. 1. *Holaspina communis* (Ishikawa, 1966): A, chelicera of male; B, epistome; C, leg II of male.

**3. *Holaspina communis* (Ishikawa, 1966) n. com. 참창응애 (Fig. 1)**

*Neoparholaspulus communis* Ishikawa, 1966, p. 101, fig. 2.;

*Parholaspulus communis*; Ehara, 1980, p. 80, fig. 28C.

**Material examined.** 1 Deutonymph, 3 ♂♂, Woongpo, Chonbuk, 10 Nov. 1997; 3 ♀♀, 1 ♂, Poonghyul, Chinan, Chonbuk 12 Nov. 1998.

**Diagnosis (male).** Body length 582–631  $\mu\text{m}$ . Body width at coxae IV 325–348  $\mu\text{m}$ . Dorsal shield with 34 pairs of simple setae. Anterior margin of dorsal shield gently rounded. Movable digit of chelicera with spermatophore nearly as long as digit itself (Fig. 1A). Epistome as Fig. 1B. Stigma between coxae III–IV; peritreme extending anteriorly to the anterior edge of coxae II. Leg I with weak claws; Leg II–IV with caruncles and claws; femur, genu and tibia with distally curved spurs (Fig. 1C). Femur IV without spur.

**Distribution.** Japan, Korea.

**4. *Holaspina dentatus* (Ishikawa, 1969) 이빨창응애**

*Parholaspulus dentatus* Ishikawa, 1969, p. 58, fig. 59; 1980, p. 15, fig. 88; Ehara, 1980, p. 81, fig. 28D.

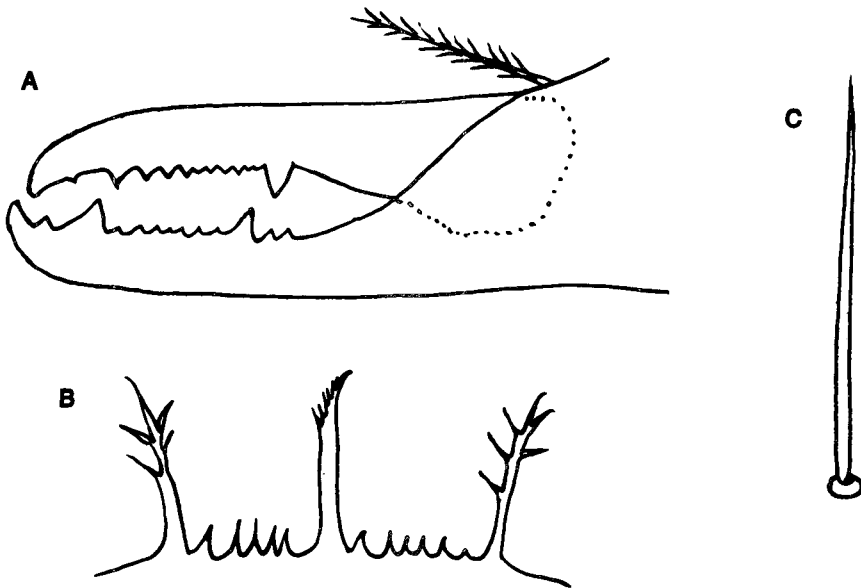
*Holaspina dentatus*; Lee et Lee, 1996, p. 152, fig. 2.

**Material examined.** 1 ♀, Naju, Chonnam, 16 Jul. 1999; 3 ♀♀, Sulaksan, Kangwon, 28 Apr. 1999.

**Distribution.** Japan, Korea.

**5. *Holaspina multidentatus* (Ishikawa, 1980) n. com. 다치창응애 (신칭) (Fig. 2)**

*Parholaspulus multidentatus* Ishikawa, 1980, p. 13, figs. 83–87.



**Fig. 2.** *Holaspina multidentatus* (Ishikawa, 1980): A, chelicera of female; B, epistome; C, dorsal seta of female.

**Material examined.** 5 ♀♀, Chonju, Chonbuk, 17 Jun. 1999.

**Diagnosis (female).** Body length 451-505 µm, body width at the level of coxa IV 253-278 µm. Dorsal shield with 29 pair of single setae (Fig. 2C). Epistome with an elongate median extension and a pair of projections divided distally (Fig. 2B). Digits of chelicera with 2 large and 10 small teeth (Fig. 2A). Tarsus I without claws and tarsus II to IV with well developed claws.

**Distribution.** Japan, Korea

**6. *Holaspina ochraceus* (Ishikawa, 1966)** 삼지창응애

*Neoparholaspulus ochraceus* Ishikawa, 1966, p. 103, fig. 3;

*Parhoraspulus ochraceus*; Ishikawa, 1980, p. 19, figs. 99-104.; Choi, 1994., p. 19, fig. 5; Ehara, 1980, p. 82, fig. 29A.

*Holaspina ochraceus*: Kwon and Lee, 1999, p. 37.

**Material examined.** 1 ♀, Yongkwang, Geumjungsan, Chonnam, 8 Jan. 1999; 2 ♀♀, Poonghyul, Chinan, Chonbuk, 12 Nov. 1998; 2 ♀♀, Sanggyesa, Chindo Is., Chonnam, 24 Jul. 1999; 2 ♀♀, Bisundae, Mt. Solak, Kangwon, 1 Sep. 1999; 3 ♂♂, Mt. Solak, Kangwon, 2 Sept. 1999; 5 ♂♂, Hoemoonsan, Sunchang, Chonbuk, 10 Jun. 1999; 2 ♂♂, Andong, Kyongbuk, 18 Aug. 1999; 12 ♀♀, Maldo Is., Chonbuk, 15 Aug. 1999; 8 ♀♀, Bogeusan, Chunchon, Kangwon, 7 Aug. 1999; 1 ♀, Yongkwang, Chonnam, 8 Jan. 1999; 15 ♀♀, Youngpoong, Kyongbuk, 10 Aug. 1999.

**Distribution.** Japan, Korea.

**Remark.** This is the most abundant species in soil from Korea.

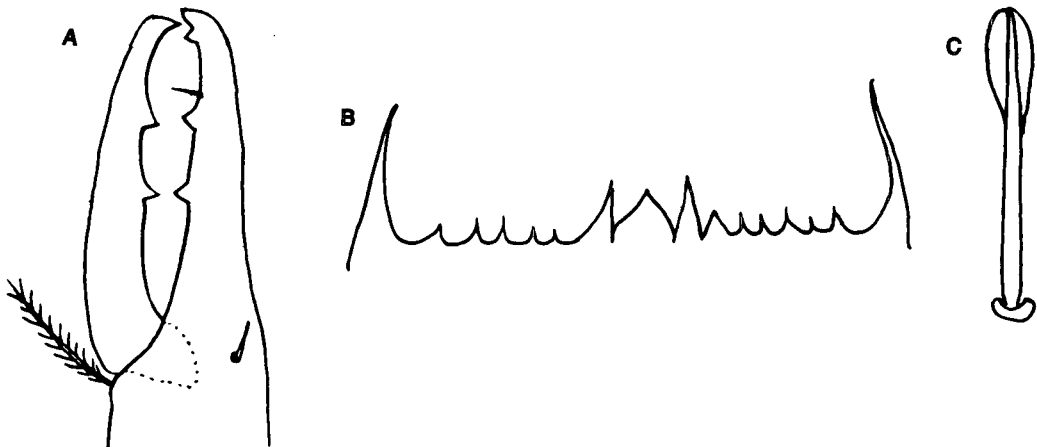
**7. *Holaspina shigaensis* (Ishikawa, 1869)** 쉬가창응애 (신칭)

*Parholaspulus shigaensis* Ishikawa, 1969, p. 56; 1980, p. 8, fig. 69; Ehara, 1980, p. 81.

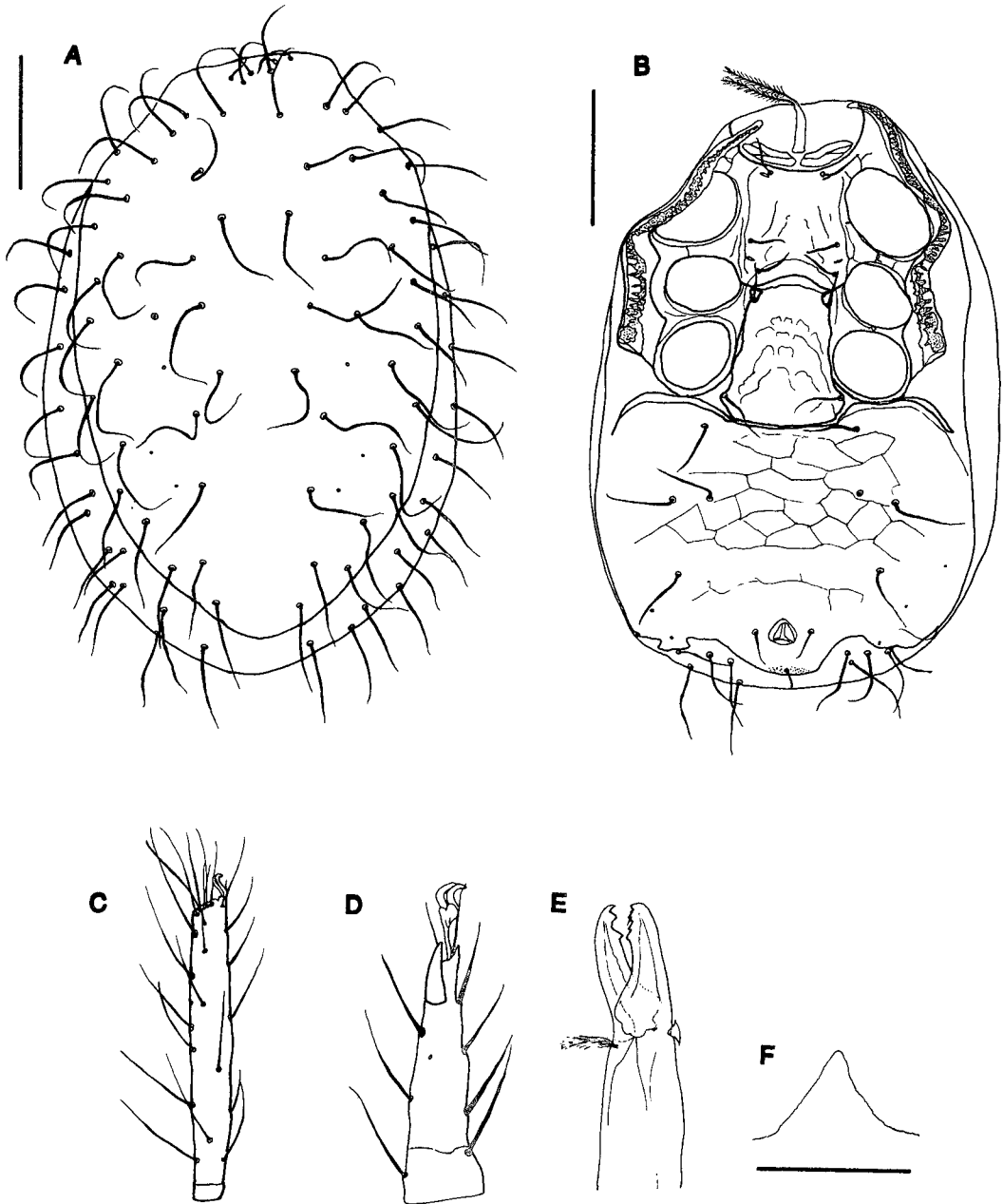
*Histiostoma shigaensis*; Lee et Lee, 1996, p. 25, fig. 2.

**Material examined.** 9 ♀♀, Chonju, Chonbuk, 15 March. 1999; 4 ♀♀, Yongkang, Chonnam, 8 Jun. 1999.

**Distribution.** Japan, Korea.



**Fig. 3.** *Holaspulus montanus* (Ishikawa, 1995): A. chelicera of female; B, epistome; C, dorsal seta of female.

**8. *Holaspina trifurcatus* (Ishikawa, 1966)** 세 갈래 창응애*Neoparholaspulus trifurcatus* Ishikawa, 1966, p. 10; 1969, p. 60.*Parholaspulus trifurcatus*; Ehara, 1980, p. 83.*Holaspina trifurcatus*; Lee et Lee, 1996, p. 26, fig. 3.

**Fig. 4.** *Neparholaspis bisunensis* n. sp.: A, dorsal shield of female; B, ventral shields of female; C, tarsus I; D, tarsus II; E, chelicera of female; F, epistome of female. (Scale: A, B, 200  $\mu$ m; C-F, 100  $\mu$ m)

**Material examined.** 3♀ ♀, Poonghyul, Chinan, Chonbuk, 25 Nov. 1998; 2♀ ♀, Sogrisan, Chungbuk, 25 Jul. 1999.

**Distribution.** Japan, Korea.

Genus *Holaspulus* Berlese, 1904 솔털창응애속 (신칭)

**9. *Holaspulus serratus* (Ishikawa, 1980) 솔털창응애**

*Gamasholaspis serratus* Ishikawa, 1980, p. 164, Figs. 141-144.

*Holaspulus serratus*; Paik, 1983, p. 46.

**Material examined.** 1♀, Gyeryong Mts., Chungnam, 4 Jul. 1999.

**Distribution.** Japan, Korea.

**10. *Holaspulus montanus* Ishikawa, 1995 설악창응애 (신칭) (Fig. 3)**

*Holaspulus montanus* Ishikawa; Ishikawa, 1995, p. 187, fig. 2.

**Material examined.** 1♀, Sinheungsa (temple), Mt. Solak, Kangwondo, 1 Sept. 1999.

**Diagnosis (female).** Body length 612 µm, body width at the level of coxa IV 435 µm. Dorsal shield with 30 pairs of spatulated setae (Fig. 3C). Epistome with 3 spinose median projections and 2 long lateral projections (Fig. 3B). Fixed digit of chelicera with 3 teeth and movable digit with 2 teeth (Fig. 3C). Tarsus I without claw and tarsus II to IV with well developed claws.

**Distribution.** Japan, Korea.

Genus *Neparholaspis* Evans, 1956 비선창응애속 (신칭)

**11. *Neparholaspis bisunensis* n. sp. 비선창응애 (신칭) (Fig. 4)**

**Type specimen.** Holotype, 1♀, Bisundae, Mt. Solak, Kangwondo, 1 Sept. 1999.

**Description (Female).** Body length 910.8 µm, width 621.0 µm. Dorsal shield entire, sclerotized and provided with 30 pairs of simple setae. The Extra-marginal setae similar in form to those on the dorsal shield. The distribution of setae and pores as shown in Fig. 4A. Tritosternum well developed with a pair of elongate pilose laciniae. Presternal shields composed of fused three pair of platelets. Sternal shield sclerotized and partially fused with endopodal shields, with 3 pair of simple setae and 2 pair of pores. Metasternal shields with a pair of simple setae and pores. Epigynial shield slightly rounded posteriorly and provided with a pair of simple setae. Ventro-anal shield partially fused post-peritrematal shield bearing 4 pair of preanal and 1 pair of perianal setae. Stigmata located near the anterolateral angles of coxae IV. Peritremes extending to coxae I; peritrematal shield partially fused with exopodal shield and extending posteriorly to coxae IV. The epistome with a serrated triangular process like mountain-shape (Fig. 4F). Movable digit of chelicera bidentate; fixed digit with 4 teeth; dorsal seta on chelicera wedge-shaped (Fig. 4E). Tarsus I with small claw; tarsi II to IV each with well developed claws and pulvilli; tarsus II with a stout spine (41 µm). Length of tarsus I, 205 µm, tibia I, 114.8 µm, genu I, 98.4 µm, femur I, 147.6 µm, trochanter I, 49.2 µm, coxa I, 106.6 µm, tarsus II, 164 µm, tibia II, 98.4 µm, genu II, 98.4 µm, femur II, 134.9 µm, trochanter II, 82 µm, coxa II, 73.8 µm, respectively.

**Etymology.** The name was derived from the collection locality, Bisundae, Mt. Solak, Kangwondo in Korea.

## REFERENCES

- Bregetova, N. G. and E. V. Koroleva, 1960. The macrochelid mites (Gammasoidea, Macrochelidae) in USSR. *Pazitologicheskii Sbornik (Leningrad)*, **19**: 32-154 (in Russian).
- Choi, S. S., 1994. Taxonomic studies on the soil mites. On unrecorded species of pro- and mesostigmatida in Korea. *Wonkwang Univ. Thesis Coll.*, **28**: 9-35 (in Korean).
- Evans, G. O., 1956. On the classification of the Family Macrochelidae with particular reference to the subfamily Parholaspinæ (Acarina Mesostigmata). *Proc. Zool. Soc. London*, **127**(3): 345-377.
- Ehara, S., 1980. Illustrations of the mites and ticks of Japan. *Zenkoku Noson Kyoiku Kyokai*, Tokyo, 562 pp.
- Farrier, M. H. and M. K. Hennessey, 1993. Soil inhabiting and free living Mesostigmata (Acari; Parasitiformes) from North America. *Tech. Bull. 302, North Carolina state Univ. Raleigh*, 408 pp.
- Ishikawa, K., 1966. Studies on the mesostigmatic mites of Japan. I. Some new species of Parholaspidæ. *Rep. Res. Matsuyama Shimonone Junior Coll.*, **2**: 99-110.
- Ishikawa, K., 1969. Taxonomic investigations on free living mites in the subalpine forest on Shiga Heights IBP area. I. Mesostigmata (1). *Bull. Nat. Sci. Mus. Tokyo*, **12**(1): 39-63.
- Ishikawa, K., 1970. Studies on the mesostigmatic mites in Japan III. Family Podapocinidae Berlese. *Ann. Zool. Jap.*, **43**(2): 112-122.
- Ishikawa, K., 1995. Two new species of the genus *Holasplus* (Acari: Gamasida: Parholaspidæ) from Japan. *Acarl.*, **36**(3): 185-190.
- Kranz, G. W., 1960. A re-evaluation of the Parholaspinæ Evans, 1956 (Acarina: Mesostigmata: Macrochelidae). *Acarologia*, t. II, fac., **4**: 393-433.
- Kwon, Y. R. and S. Y. Lee, 1999. Soil microarthropod fauna in forest communities at the Gaya mountain national park. *Korean J. Soil Zool.*, **4**(1): 33-39 (in Korean).
- Lee, S. Y. and W. K. Lee, 1996. Three soil mites of the genus *Holaspina* (Parholaspidæ: Mesostigmata) from Korea. *Korean J. Soil Zool.*, **1**(1): 24-27 (in Korean).
- Lee, S. Y. and W. K. Lee, 1996. Three soil mites of the Family Parholaspidæ and Podapocinidae (Mesostigmata, Acari) from Korea. *Korean Arachnol.*, **12**(2): 131-137 (in Korean).
- Paik, U. H., 1983. A survey on the predatory mites in Korea. *San-Hak-Hyup-Dong Report*, 53 pp. (in Korean).

RECEIVED: 9 March 2000

ACCEPTED: 10 April 2000

한국산 창응애과(진드기아강, 중기문목)의 분류학적 연구

이 원 구 · 이 소 영  
(전북대학교 자연과학대학 생물과학부)

요 약

1998년 12월부터 1999년 10월 사이에 남한의 삼림 및 초지 토양에서 채집된 중기문응애류를 조사한 결과 1 신종, *Neparholaspis bisunensis* n. sp.와 3 미기록종, *Holaspina communis*, *H. multidentatus* 및 *Holaspulus montanus*를 포함한 11종의 창응애과가 동정되었다.