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MACROLYCUS WATERHOUSE, 1878 (COLEOPTERA: LYCIDAE) OF CONTINENTAL CHINA

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ABSTRACT

Macrolycus Waterhouse, 1878 (*Coleoptera: Lycidae*) of continental China

A review of species of the genus *Macrolycus* Waterhouse, 1878 from continental China is carried out. Seven new species are described: *Macrolycus yunnanus* **sp. n.**, *M. shaanxiensis* **sp. n.**, *M. aurantiacus* **sp. n.**, *M. pusillus* **sp. n.**, *M. bocakorum* **sp. n.**, *M. galinae* **sp. n.** and *M. murzini* **sp. n.** A key to all known taxa from the area is presented (*Coleoptera: Lycidae*).

Key words: Coleoptera, Lycidae, Lycinae, Macrolycini, new species, taxonomy, continental China.

INTRODUCTION

The genus *Macrolycus* Waterhouse, 1878 is one of the few Lycid genera whose distribution area almost precisely coincides with the limits of the Subregio Palaearchaearctica of SEMENOV-TIAN-SHANSKIJ (1936), not going farther west than the Eastern Himalayas, farther south than Upper Burma (Myanmar) and Tonkin (North Vietnam), and farther north than the Amur valley. Surprisingly, most species of *Macrolycus* have been described or reported from the periphery of this area, i.e., Ussuri with 4 species (KAZANTSEV, 1995), Japan from where 14 species are reported (NAKANE, 1994), Taiwan with 7 species (NAKANE, 1967), and North Vietnam where also 7 species occur (KAZANTSEV, 1993). At the same time only four species have been known so far from continental China (*M. flabellatus* Motschulsky, 1860, *M. spinicollis* Fairmaire, 1891, *M. aemulus* Barovskij, 1930 and *M. atronotatus* Pic, 1939; KLEINE, 1942). This however reflects the fact that the fauna of this country is still rather poorly studied. Recent collecting there has indeed revealed several species new to science, seven of which are described below.

The following abbreviations are used in the paper:
ICM – Insect Centre, Moscow;
LMB – collection of L.Bocák & M.Bocáková

MORPHOLOGY AND SYSTEMATIC ACCOUNT

Macrolycus flabellatus Motschulsky, 1860

Distribution. «Manchuria» (Heilongjiang).

This species is widely distributed and common in the South of the Russian Far East and Japan.

Macrolycus spinicollis Fairmaire, 1891
= *Macrolycus inaequalis* Pic, 1922

Distribution. China (Chan Yang).

No type of this species has been found so far. It is still easily distinguishable from all other Chinese *Macrolycus* by the blue metallic tint of the underside and the short male antennal lamellae that are even shorter than in *M. bowringi* Waterhouse (FAIRMAIRE, 1891), whereas in all its congeners of similar coloration from China these are definitely longer. The possibility that *M. spinicollis* in fact belongs in a different family (Cantharidae, where there exists a lycid-looking genus *Lycocerus* Gorham, 1889) should not be ruled out, as , for instance, *Lipernes yunnanus* Fairmaire, 1886 proved to be a *Lycocerus* (KAZANTSEV, 1993, 1999).

Macrolycus aemulus Barovskij, 1930

Distribution. «Manchuria» (Heilongjiang).

This species is locally distributed in South Ussuri area. Its record from Kuatun, Fukien (KLEINE, 1950) was obviously based on erroneous identification and must be disregarded.

Macrolycus atronotatus Pic, 1939

Distribution. Shansi, Sichuan.

The lectotype of *M. atronotatus* was designated and studied, with the antennae and aedeagus illustrated in KAZANTSEV (1993).

Macrolycus yunnanus sp. n. (Figs. 1-3)

Diagnosis

M. yunnanus sp. n. is easily distinguishable from all *Macrolycus* species by its orange coloration, relatively long antennal lamellae and the shape of the aedeagus with developed parameres (Figs. 2-3). Together with *M. shaanxiensis* sp. n. it forms a natural complex with *M. bowringi* Waterhouse and *M. jeanvoinei* Pic that have similar aedeagi (KAZANTSEV, 1993).

Description

Male. Black. Pronotum and elytra orange testaceus.

Head with conspicuous antennal prominence, antennal sockets separated with minute lamina. Eyes relatively small. Distal joint of maxillary and labial palpi large, elongate, widest near base. Antennae from 3rd joint lamellate, reaching over half of elytra, with 2nd joint transverse, lamella of 3rd one short (Fig. 1); all joints with very short decumbent pubescence.

Pronotum transverse, 1.3 times wider than long, with almost straight sides, prominent blunt anterior and acute conspicuous laterally produced posterior angles; front margin almost triangularly produced forward, hind one biarcuate; median longitudinal rib almost reaching pronotal centre.

Scutellum elongate, nearly parallelsided, slightly emarginate at apex.

Elytra with elevated humeri, as wide as pronotum basally and 3.6 times as long as wide humerally, widened posteriorly, with four strong longitudinal costae and irregular double rows of reticulation in interstices; 3rd costa disappearing shortly

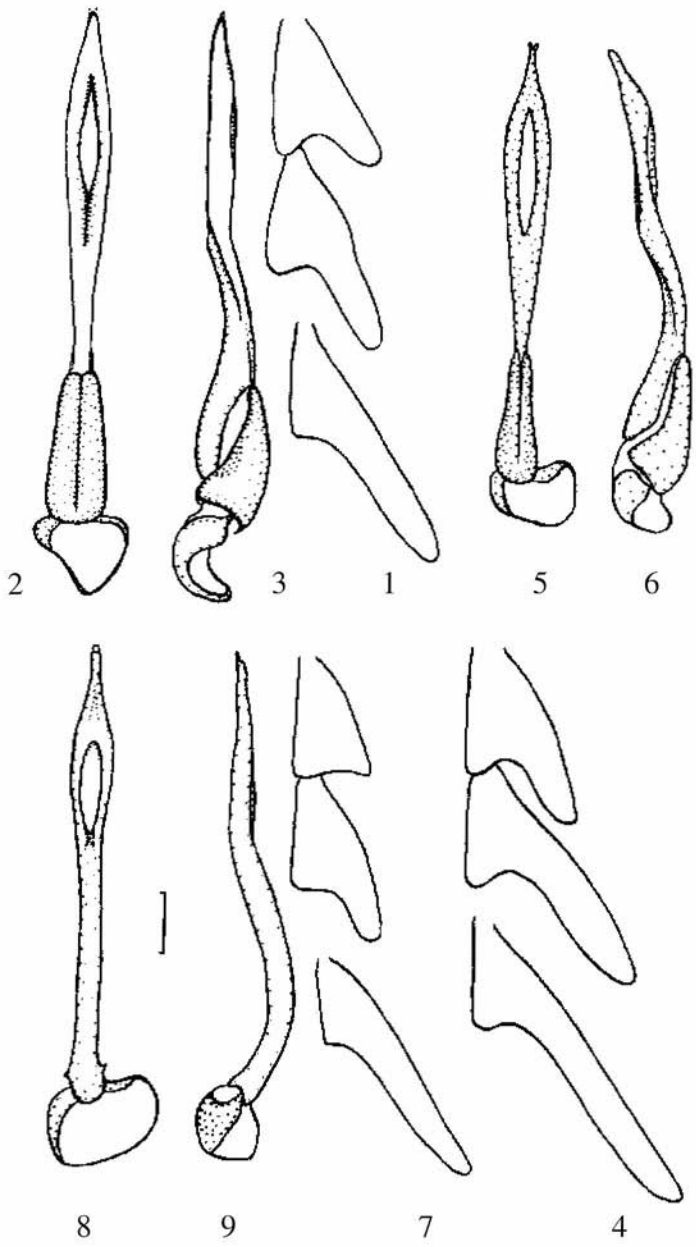

Fig. 1-9. Aedeagi and antennae of *Macrolycus* species: *M. yunnanus* sp. n., 3rd, 4th and 8th antennal joints (1); same, aedeagus, dorsally (2); same, aedeagus, laterally (3); *M. shaanxiensis* sp. n., 3rd, 4th and 8th antennal joints (4); same, aedeagus, dorsally (5); same, aedeagus, laterally (6); *M. aurantiacus* sp. n., 3rd, 4th and 8th antennal joints (7); same, aedeagus, dorsally (8); same, aedeagus, laterally (9). Scale: 0.5 mm.

before apex. Pubescence uniform, decumbent, short and dense, concealing interstitial reticulation.

Legs slender; tarsi slightly longer than half of pertinent tibiae.

Aedeagus with developed parameres (Figs. 2-3).

Female. Similar to male, but antennae serrate, not lamellate.

Length: 12.7-15.5 mm. Width (humerally): 3.0-3.6 mm.

Type material

Holotype male: China: NW Yunnan, Haba Mts., NE slopes, 3600 m, VI-VII.1998, S.Murzin (ICM); paratype female: same label; paratype female: China, NW Yunnan, Yanmen env., ca. 3000 m, July 1996 (ICM).

Macrolycus shaanxiensis sp. n. (Figs. 4-6)

Diagnosis

M. shaanxiensis sp. n. is classified near *M. yunnanus* sp. n., differing by the coloration, the longer antennal lamellae (Fig. 4), less conspicuous elytral reticulation and the details of the aedeagus (Figs. 5-6).

Description

Male. Black. Pronotum and elytra dark red; 1st and 2nd antennal joints posteriorly testaceus.

Head with conspicuous antennal prominence, antennal sockets separated with minute lamina. Eyes relatively small. Distal joint of maxillary and labial palpi large, elongate, widest near base. Antennae from 3rd joint lamellate, reaching over half of elytra, with 2nd joint transverse, lamella of 3rd one almost as long as joint itself (Fig. 4); all joints with very short decumbent pubescence.

Pronotum transverse, 1.5 times wider than long, narrowing anteriorly, with prominent blunt anterior and acute conspicuous laterally produced posterior angles; front margin medially produced forward, hind one biarcuate; median longitudinal rib reaching over anterior third.

Scutellum elongate, nearly parallelsided, slightly emarginate at apex.

Elytra with elevated humeri, as wide as pronotum basally and 3.4 times as long as wide humerally, widened posteriorly, with four strong longitudinal costae and traces of irregular reticulation in interstices; 3rd costa disappearing shortly before apex. Pubescence uniform, decumbent, short and dense, concealing interstitial reticulation.

Legs slender; tarsi slightly longer than half of pertinent tibiae.

Aedeagus bent in lateral view, with developed parameres and relatively long apical cavity (Figs. 5-6).

Female. Unknown.

Length: 13.3-13.9 mm. Width (humerally): 3.0-3.3 mm.

Type material

Holotype male: China: Shaanxi, env. Haozhenzi, 1350-2000 m, 14-24.VI.1999, S.Murzin (ICM); paratype male: same label (ICM); paratype male: China: S Gansu, Minshan, 70 km W Wudu, 2000-2700 m, 25.VII.2000, A.Gorodinsky (ICM).

Macrolycus aurantiacus sp. n. (Figs. 7-9)

Diagnosis

M. aurantiacus sp. n. being similar in the coloration to *M. yunnanus* sp. n. is readily distinguishable by the testaceus labrum, the shape of the pronotum, definitely less conspicuous elytral reticulation and by the shape of the aedeagus (Figs. 8-9).

Description

Male. Black. Pronotum and elytra orange testaceus; labrum and 1st and 2nd antennal joints posteriorly testaceus.

Head with inconspicuous antennal prominence, narrow groove between eyes and noticeable round impression behind them; antennal sockets separated with minute lamina. Eyes relatively small. Distal joint of maxillary and labial palpi large, elongate, widest near base. Antennae from 3rd joint lamellate, reaching over half of elytra, with 2nd joint transverse, lamella of 3rd one minute (Fig. 7); all joints with very short decumbent pubescence.

Pronotum transverse, 1.15 times wider than long, with parallel sides, prominent blunt anterior and acute laterally produced posterior angles; front margin triangularly produced forward, hind one biarcuate; median longitudinal rib reaching over anterior third, lateral folds inconspicuous.

Scutellum elongate, nearly parallelsided, rounded at apex.

Elytra as wide as pronotum basally and 4.1 times as long as wide humerally, widened posteriorly, with four longitudinal costae; 1st and 3rd costae definitely weaker than 2nd and 4th. Pubescence uniform, decumbent, short and dense, concealing interstitial punctuation.

Legs slender; tarsi slightly longer than half of pertinent tibiae.

Aedeagus with no carinae on lateral surface (Figs. 8-9).

Female. Similar to male, but antennae serrate, not lamellate.

Length: 12.0-13.1 mm. Width (humerally): 2.7-2.9 mm.

Type material

Holotype male: China, NW Yunnan, Yanmen env., ca. 3000 m, July 1996 (ICM). (ICM); paratype female: same data (ICM).

Macrolycus pusillus sp. n. (Figs. 10-12)

Diagnosis

M. pusillus sp. n. differs from similarly coloured *Macrolycus* species by the small size (less than 8 mm), the structure of the antennae and the shape of the aedeagus with narrow and deeply emarginate apex (Figs. 11-12). Due to its size and elytral structure (with only two conspicuous costae) this species from Fujiang (Fukien) could have easily been confused with *Dilophotes*.

Description

Male. Dark brown. Pronotum and elytra brownish red.

Head with inconspicuous antennal prominence, narrow groove between eyes and elongate impression behind them; antennal sockets separated with minute lamina. Eyes relatively small. Distal joint of maxillary and labial palpi large, elongate, widest near base. Antennae from 3rd joint lamellate, reaching over half of elytra, with 2nd joint transverse, lamella of 3rd one moderately long (Fig. 10); all joints with very short decumbent pubescence.

Pronotum transverse, 1.2 times wider than long, with parallel sides, slightly convex near posterior angles, with prominent almost straight anterior and acute inconspicuous laterally produced posterior angles; front margin feebly triangularly produced forward, hind one biarcuate; median longitudinal rib reaching over anterior third, lateral folds inconspicuous.

Scutellum elongate, nearly parallelsided, straight at apex.

Elytra as wide as pronotum basally and 3.6 times as long as wide humerally, widened posteriorly, with four longitudinal costae; 1st costa definitely weaker than 2nd and 4th, 3rd one practically unnoticeable. Pubescence uniform, decumbent, short and dense, concealing interstitial punctuation.

Legs slender; tarsi slightly longer than half of pertinent tibiae.

Aedeagus with narrow and deeply emarginate apex (Figs. 11-12).

Female. Unknown.

Length: 7.8 mm. Width (humerally): 1.8 mm.

Type material

Holotype male: China: Fujiang, Wuyi Shan, 22.V.1998, S.Kazantsev (ICM).

Macrolycus bocakorum sp. n. (Figs. 13-15)

Diagnosis

M. bocakorum sp. n. should evidently be placed near *M. pusillus* sp. n. differing by the larger size, the acute apices of the antennal lamellae (Fig. 13), the more conspicuous elytral costae and the shape of the aedeagus (Figs. 14-15).

Description

Male. Black. Pronotum and elytra reddish brown; 2nd antennal joint brownish testaceus.

Head with relatively inconspicuous antennal prominence, narrow groove between eyes and elongate impression behind them; antennal sockets separated with minute lamina. Eyes relatively small. Ultimate joint of maxillary and labial palpi large, elongate, widest near base. Antennae from 3rd joint lamellate, reaching over half of elytra, with 2nd joint transverse, lamella of 3rd one relatively short (Fig. 13); all joints with very short decumbent pubescence.

Pronotum transverse, 1.3 times wider than long, widening anteriorly, with prominent blunt anterior and acute laterally produced posterior angles; front margin medially slightly produced forward, hind one biarcuate; median longitudinal rib reaching over anterior third, lateral ribs near margins conspicuous.

Scutellum elongate, nearly parallelsided, emarginate at apex.

Elytra as wide as pronotum basally and 12.3:3.5 times as long as wide humerally, widened posteriorly, with four longitudinal costae; 3rd costa definitely weaker than the rest, almost unnoticeable. Pubescence uniform, decumbent, short and dense.

Legs slender; tarsi slightly longer than half of pertinent tibiae.

Aedeagus with relatively short and robust apex (Figs. 14-15).

Female. Similar to male, but antennae serrate, not lamellate.

Length: 10.3-14.8 mm. Width (humerally): 2.4-3.8 mm.

Type material

Holotype male: China, Sichuan, Nanping Ta Zang, 33.15N/104.15E, 2200 m, 15-18.VI.1990, ChS (LMB); paratypes: 4 males, same label (LMB and ICM); male, China, Sichuan, Mt. Emei, 5-19.VI.1989, L. Bocák (LMB); female, China, Sichuan, 200 km SW Yaan, Liziping env., near Shimean, 27.VII-3.VIII.1991, Z.Kejvel (LMB); female, China, Sichuan, Liziping, 28.VI-3.VII.1991, R.Dunda (LMB); male, China, Sichuan, Abazhou, Nanping, Jiuzhaigou, 33.15N/104.15E, 2000 m, 8-13.VI.1990, ChS (ICM); male and 6 females, China: Shaanxi, env. Haozhenzi, 1350-2000 m, 14-24.VI.1999, S.Murzin (ICM).

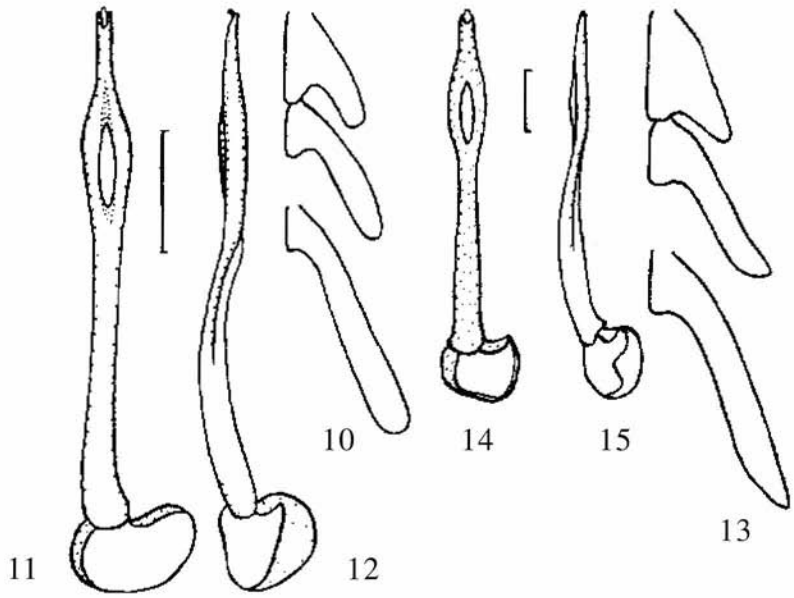

Fig. 10-15. Aedeagi and antennae of *Macrolycus* species: *M. pusillus* sp. n., 3rd, 4th and 8th antennal joints (10); same, aedeagus, dorsally (11); same, aedeagus, laterally (12); *M. bocakorum* sp. n., 3rd, 4th and 8th antennal joints (13); same, aedeagus, dorsally (14); same, aedeagus, laterally (15). Scale: 0.5 mm.

Macrolycus galinae sp. n. (Figs. 16-18)

Diagnosis

M. galinae sp. n. is easily distinguishable from other *Macrolycus* species by the shape of the pronotum, the long antennal lamellae (Fig. 16) and the elongate slender aedeagus (Figs. 17-18).

Description

Male. Black. Pronotum and elytra red; 1st to 5th antennal joints posteriorly testaceus.

Head with inconspicuous antennal prominence and narrow groove between eyes; antennal sockets separated with minute lamina. Eyes relatively small. Distal joint of maxillary and labial palpi large, elongate, widest near base. Antennae from 3rd joint lamellate, reaching over half of elytra, with 2nd joint transverse, lamella of 3rd one long, lamella of 8th one 6 times as long as joint itself (Fig. 15); all joints with very short decumbent pubescence.

Pronotum transverse, 1.5 times wider than long, slightly widening anteriorly, with prominent blunt anterior and acute laterally produced posterior angles; front margin triangularly produced forward and minutely emarginate at apex, hind one almost straight; median longitudinal rib almost reaching centre, lateral ribs nearly obsolete.

Scutellum elongate, parallelsided, straight at apex.

Elytra as wide as pronotum basally and 3.8 times as long as wide humerally, widened posteriorly, with four longitudinal costae; 3rd costa almost unnoticeable. Pubescence uniform, decumbent, short and dense.

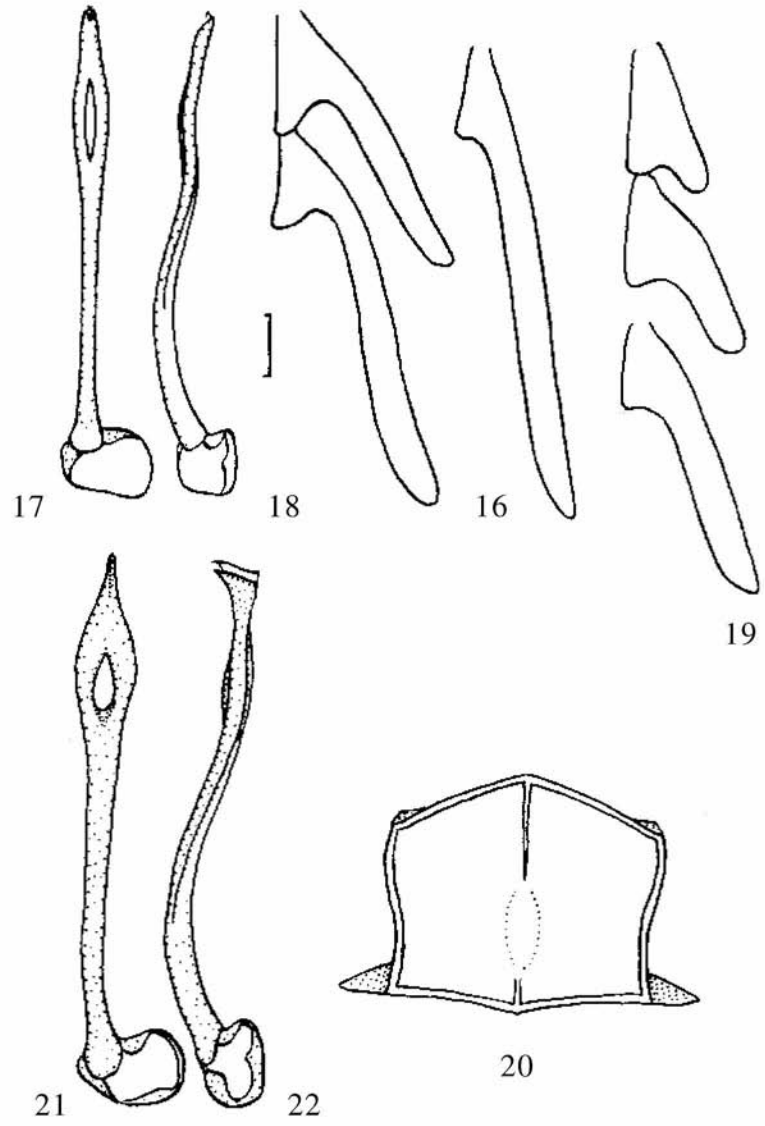

Fig. 16-22. Details of *Macrolycus* species: *M. galinae* sp. n., 3rd, 4th and 8th antennal joints (16); same, aedeagus, dorsally (17); same, aedeagus, laterally (18); *M. murzini* sp. n., 3rd, 4th and 8th antennal joints (19); same, pronotum (20); same, aedeagus, dorsally (21); same, aedeagus, laterally (22). Scale: 0.5 mm.

Legs slender; anterior tarsi nearly as long as pertinent tibiae.
Aedeagus with no carinae on lateral surface (Figs. 17-18).
Female. Unknown.
Length: 14.1 mm. Width (humerally): 3.1 mm.

Type material

Holotype male: China, C Sichuan, Xiling Snow Mts., 2100-2700 m, 12-20.VII.1999, S.Kazantsev (ICM).

Macrolycus murzini sp. n. (Figs. 19-22)

Diagnosis

M. murzini sp. n. readily differs from all its close species from continental China by the shape of the aedeagus (Figs. 21-22), which approaches that of *M. excellens* Nakane from Japan, and the shape of the pronotum (Fig. 20).

Description

Male. Black. Pronotum and elytra dark red.

Head with inconspicuous antennal prominence and narrow groove between eyes; antennal sockets separated with minute lamina. Eyes relatively small. Distal joint of maxillary and labial palpi large, elongate, widest near base. Antennae from 3rd joint lamellate, reaching over half of elytra, with 2nd joint transverse, lamella of 3rd one short (Fig. 19); all joints with very short decumbent pubescence.

Pronotum transverse, 1.2 times wider than long, widest near anterior margin, with prominent blunt anterior, acute posterior angles and produced lateral lobes; front margin triangularly produced forward, hind one nearly straight; median anterior longitudinal rib almost reaching posterior half, lateral folds nearly obsolete (Fig. 20).

Scutellum elongate, nearly parallelsided, feebly emarginate at apex.

Elytra 4.1 times as long as wide humerally, slightly widened posteriorly, with four longitudinal costae; 3rd costa definitely weaker than the rest. Pubescence uniform, decumbent, short and dense, concealing interstitial punctuation.

Legs slender; anterior tarsi nearly as long as pertinent tibiae.

Aedeagus with dorsally produced apex (Figs. 21-22).

Female. Unknown.

Length: 13.1 mm. Width (humerally): 3.0 mm.

Type material

Holotype male: China: Shaanxi, Taibaishan Nat. Park, 1350 m, 10.VI.1999, S.Murzin (ICM).

Key to species of *Macrolycus* of continental China

1 Pronotum and elytra uniformly orange 2
– Elytra red (dark red, dark purple red, brownish red) or pronotum with conspicuous black discal spot 4

2 Underside with blue metallic tint. Antennae feebly lamellate. Scutellum orange ..... *M. spinicollis* Fairmaire
– Underside with no metallic tint. Antennal lamellae long (Figs. 1, 4, 7, 10, 13, 16, 19). Scutellum black or dark brown 3

3 Labrum testaceus. 3rd antennal joint not lamellate (Fig. 7). Aedeagus without parameres (Figs. 8-9) ..... *M. aurantiacus* **sp. n.**
– Labrum black. 3rd antennal joint with short lamella (Fig. 1). Aedeagus with short parameres (Figs. 2-3) ..... *M. yunnanus* **sp. n.**

4 Pronotum uniformly black or dark brown. Elytra cinnabar red ..... *M. aemulus* Barovskij
– Pronotum reddish and covered with reddish pubescence, at least at margins 5
5 Pronotum with conspicuous black discal spot ..... *M. atronotatus* Pic
– Pronotum without black discal spot, at most infuscated discally 6
6 Antennae moderately lamellate (Fig. 4). Aedeagus with short parameres (Figs. 5-6) ..... *M. shaanxiensis* **sp. n.**
– Aedeagus without parameres 7
7 Aedeagus with dorsally produced apex 8
– Aedeagus with simple narrowed apex 9
8 Antennae moderately lamellate (Fig. 19). Pronotum with straight margined hind angle (Fig. 20). Aedeagus with short dorsal projection (Figs. 21-22) ..... *M. murzini* **sp. n.**
– Aedeagus with long dorsal projection ..... *M. falabellatus* Motschulsky
9 Antennal lamellae very long (Fig. 16). Aedeagus long and narrow before apex (Figs. 17-18) ..... *M. galinae* **sp. n.**
– Antennal lamellae shorter (Figs. 10, 13). Aedeagus wider apically (Figs. 11-12, 14-15) 10
10 Smaller (less than 8 mm). Apices of antennal lamellae rounded (Fig. 10). Aedeagus with narrow and deeply emarginate apex (Figs. 11-12) ..... *M. pusillus* **sp. n.**
– Larger (10-15 mm). Apices of antennal lamellae acute (Fig. 13). Aedeagus with wider and less emarginate apex (Fig. 14-15) ..... *M. bocakorum* **sp. n.**

DISCUSSION

Unlike most Lycid genera, *Macrolycus* is characterized by constant coloration of the upperside and rather uniform shape of the aedeagus. The elytra of *Macrolycus* species are always orange or reddish, and never black or bicoloured, whereas other Lycidae of one and the same genus are often coloured differently in different regions and even localities. Three species reported from Yunnan have orange upperside (*M. spinicollis* Fairmaire, *M. yunnanus* sp. n. and *M. aurantiacus* sp. n.), while the other eight species from Central and Eastern China have reddish elytra. The elytra are usually densely punctured and deprived of reticulation, bearing four costae each, two or three of which are always conspicuous. Only some species (i.e. *M. yunnanus* sp. n.) have transverse ribs and traces of double rows of irregular cells in the elytral interstices.

The bifid claws in all tarsi are considered the most derived feature in *Macrolycus*, as well as in the tribe Macrolycini, and serve as the basis for separation of the group at the suprageneric level (BOCÁK & BOCÁKOVÁ, 1990). However this does not correspond to what we know about superfamily Cantharoidea in general and the systematics of the sister family Cantharidae where the difference in structure of the claws, i.e., bifid claws vs. simple ones, is often viewed as of subgeneric importance at most. The situation with phylogeny in Lycidae might have been different, if similar relationships had not been discovered in *Dilophotes* Waterhouse, 1879, a genus making part of Macrolycini itself, where forms with

simple claws had been found (Kazantsev, manuscript in preparation). This urges that the status of this group must be carefully reconsidered and additional characters substantiating its separation have to be detected, and it should to deserve the rank of tribe.

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