Four New Species of the Amblyoponine Ant Genus *Amblyopone* (Hymenoptera: Formicidae) from Southwestern China with a Key to the Known Asian Species

by

Zheng-Hui Xu¹ & Jiao-Jiao Chu¹

**ABSTRACT**

Four new species of the amblyoponine ant genus *Amblyopone* Erichson, 1842 collected from southwestern China are described, i.e. *A. kangba* sp. nov., *A. zoma* sp. nov., *A. meiliana* sp. nov., and *A. awa* sp. nov. The queen caste of *A. awa* sp. nov. is reported. Measurements are supplemented to *A. octodentata* Xu based on the newly collected specimens. A key to the 29 known Asian species of the genus is provided based on the worker caste. Illustrations are provided for each species except for *A. quadrata* (Karavaiev).

Key words: Hymenoptera: Formicidae, Amblyoponinae, *Amblyopone*, New species, Asian species.

**INTRODUCTION**

The amblyoponine ant genus *Amblyopone* Erichson, 1842 is widely distributed in the world tropics and temperate zones (Bolton 1995). Before this study, 72 living species were recorded in the world (Bolton 2012).


In the Ant Diversity Investigations of Southwestern China, 4 new species of *Amblyopone* were collected. The new species are described. The queen caste of *A. awa* sp. nov. is reported. Measurements are supplemented to *A. octodentata* Xu based on the newly collected specimens.

¹ Key Laboratory of Forest Disaster Warning and Control in Yunnan Province, College of Forestry, Southwest Forestry University, Kunming, Yunnan Province 650224, China, E-mail: xuzhenghui1962@163.com
In order to facilitate the identification of the species of *Amblyopone*, a key to the 29 known Asian species is provided based on the worker caste. Illustrations are provided for each species except for *A. quadrata* (Karavaiev).

**MATERIALS AND METHODS**

The worker and queen castes of the new species and *A. octodentata* Xu were collected by the sample-plot method. Descriptions and measurements were made under a XTB-1 stereo microscope with a micrometer. Illustrations of the new species were made under a Motic-700Z stereo microscope with illustrative equipment. Figures of most species were drawn from the Antweb images except for those cited from original descriptions.

Standard measurements and indices are as defined in Bolton (1975), in addition, ML, ED, and AL are supplemented:

- **TL**-Total Length: The total outstretched length of the individual, from the mandibular apex to the gastral apex.
- **HL**-Head Length: The straight-line length of the head in perfect full-face view, measured from the mid-point of the anterior clypeal margin to the mid-point of the occipital margin. In species where one or both of these margins is concave, the measurement is taken from the mid-point of a transverse line that spans the apices of the projecting portions.
- **HW**-Head Width: The maximum width of the head in full face view, excluding the eyes.
- **CI**-Cephalic Index = HW×100 / HL.
- **SL**-Scape Length: The straight-line length of the antennal scape, excluding the basal constriction or neck.
- **SI**-Scape Index = SL×100 / HW.
- **ML**-Mandible Length: The straight-line length of the mandible measured from apex to the lateral base.
- **ED**-Eye Diameter: The maximum diameter of the eye.
- **PW**-Pronotal Width: The maximum width of the pronotum measured in dorsal view.
- **AL**-Alitrunk Length: The diagonal length of the alitrunk in profile view, measured from the point at which the pronotum meets the cervical shield to the posterior basal angle of the metapleuron.
PL—Petiole Length: The length of the petiole measured in profile from the anterior process to the posteriormost point of the tergite, where it surrounds the gastral articulation.

PH—Petiole Height: The height of the petiole measured in profile from the apex of the ventral (subpetiolar) process vertically to a line intersecting the dorsalmost point of the node.

DPW—Dorsal Petiole Width: The maximum width of the petiole in dorsal view.

LPI—Lateral Petiole Index = PH×100/PL.

DPI—Dorsal Petiole Index = DPW×100/PL.

All measurements are expressed in millimeters.

The type specimens are deposited in the Insect Collection, Southwest Forestry University (SWFU), Kunming, Yunnan Province, China.

KEY TO KNOWN ASIAN SPECIES OF AMBLYOPONE BASED ON THE WORKER CASTE

1 Antennae 10- or 11-segmented ................................................................. 2
- Antennae 12-segmented ........................................................................... 5

2 Antennae 10-segmented (Japan) (Figs. 1-2) .................. A. fulvida Terayama
- Antennae 11-segmented ........................................................................... 3

3 In full-face view, head about as broad as long. Mandibles deeply split at third tooth counting from apex. In profile view, subpetiolar process short and broad, roughly square (India) (Figs. 3-4) ........ A. pertinax Baroni Urbani
- In full-face view, head distinctly longer than broad. Mandibles not deeply split at third tooth counting from apex. In profile view, subpetiolar process long and narrow, slender .................................................. 4

4 In full-face view, anterior clypeal margin with 5 teeth. In profile view, posterodorsal corner of propodeum and anterodorsal corner of petiolar node rounded. Subpetiolar process oblique (Japan) (Figs. 5-6) ..................
- In full-face view, anterior clypeal margin with 8 teeth. In profile view, posterodorsal corner of propodeum and anterodorsal corner of petiolar node bluntly angled. Subpetiolar process horizontal (China: Taiwan) (Figs. 7-8) ................................................................. A. sakaii Terayama

5 In full-face view, head nearly square, about as broad as long .............. 6
- In full-face view, head elongate trapezoidal, distinctly longer than broad...

6 In full-face view, anterior clypeal margin with 4-6 minute rectangular denticles

- In full-face view, anterior clypeal margin with 10-16 triangular or rectangular denticles

7 In profile view, anterodorsal corner of petiolar node bluntly angled; subpetiolar process roughly rectangular, anteroventral corner acutely angled (China: Guangxi) (Figs. 9-10) ...............................A. eminia Zhou
- In profile view, anterodorsal corner of petiolar node rounded, anterior face vertical to dorsal face; subpetiolar process triangular or square...........8
8 In full-face view, occipital margin narrowly deeply concave in the middle. In profile view, subpetiolar process triangular (China: Hunan) (Figs. 11-12) ...............................................................A. rubiginoa Wu et Wang
- In full-face view, occipital margin widely weakly concave. In profile view, subpetiolar process roughly square (China: Tibet and Yunnan) (Figs. 13-15) .............................................................................. A. kangba sp. nov.
9 In full-face view, anterior clypeal margin with about 10 denticles, and a large protruding tooth on each side (India) (Figs. 16-17)....A. bellii Forel
- In full-face view, anterior clypeal margin with 12-17 denticles, lateral sides without protruding large teeth.................................................................................. 10
10 In full-face view, anterior clypeal margin with about 17 denticles. Eyes larger, with its diameter about as broad as the width of antennal scape (Indonesia) (Figs. 18-19) .................................................................A. reclinata Mayr
-- In full-face view, anterior clypeal margin with about 12 denticles. Eyes

smaller, with its diameter narrower than the width of antennal scape.. 11
11 In full-face view, anterior clypeal margin with about 12 rectangular den-
ticles. Occipital corners rounded (China: Taiwan) (Figs. 20-21) ..............
......................................................................................................A. bruni (Forel)
-- In full-face view, anterior clypeal margin with about 12 triangular denticles.

Occipital corners blunt (Vietnam) ....................... *A. quadrata* (Karavaiev)  
12 Anterior clypeal margin with more than 10 denticles, the denticles not divided into lobes................................................................. 13
-- Anterior clypeal margin with less than 10 teeth or lobes, some teeth maybe divided into lobes................................................................. 15
13 Anterior clypeal margin with 10 denticles, and a large triangular tooth on each side (Myanmar) (Figs. 22-23)................................. *A. feae* (Emery)  
-- Anterior clypeal margin with 12-15 denticles, lateral sides without large triangular teeth................................................................. 14
14 In full-face view, occipital margin weakly concave. Anterior clypeal margin

with about 12 denticles. In profile view, anterodorsal corner of petiolar node bluntly angled. Posteroventral corner of subpetiolar process acutely toothed (China: Yunnan) (Figs. 24-25).................................*A. crenata* Xu

-- In full-face view, occipital margin nearly straight. Anterior clypeal margin with about 15 denticles. In profile view, anterodorsal corner of petiolar node rounded. Posteroventral corner of subpetiolar process rightly angled (India) (Figs. 26-27).............................................................*A. rothneyi* Forel

15 Anterior clypeal margin with a broad large middle lobe, each side with 1 or 2 simple teeth and a narrow small lateral lobe .............................................. 16

-- Anterior clypeal margin without a broad large middle lobe, teeth simple or pairly combined at base .......................................................... 19

16 Anterior clypeal margin with 2 simple teeth between the middle and lateral lobes. The middle lobe truncated at apex, and with a small denticle on each side (China: Tibet) (Figs. 28-30)............................*A. zoma* sp. nov.

-- Anterior clypeal margin with 1 simple tooth between the middle and lateral lobes. The middle lobe with 4 denticles............................................. 17

17 In full-face view, occipital margin narrowly weakly concave in the middle. Occipital corners rounded. Eyes absent (China: Yunnan) (Figs. 31-32) .. ........................................................................................................ 18

-- In full-face view, occipital margin widely weakly concave. Occipital corners prominent. Eyes present ................................................................. 19

18 In full-face view, lateral sides of head nearly straight, anterolateral corner with a short tooth. Lateral lobes of anterior clypeal margin bifid at apex. Eyes each with 5 facets. In profile view, subpetiolar process roughly triangular (China: Yunnan) (Figs. 33-35).................................*A. meiliana* sp. nov.

-- In full-face view, lateral sides of head weakly convex, anterolateral corner with a long tooth. Lateral lobes of anterior clypeal margin simple. Eyes each with about 18 facets. In profile view, subpetiolar process roughly rectangular (New Guinea) (Figs. 36-37)..........................*A. noonadan* Taylor

19 Anterior clypeal margin with 6 teeth .................................................. 20

-- Anterior clypeal margin with 7-8 teeth ............................................. 22

20 Anterior clypeal margin straight, with 6 isolated teeth, the lateral ones larger than the others (Vietnam) (Fig. 38) ..........*A. amblyops* (Karavaiev)

-- Anterior clypeal margin roundly convex, the median 2 teeth combined at
base, the lateral ones not larger than the others................................. 21
21 The lateral 2 teeth of the anterior clypeal margin combined at base. Man-
dibles relatively narrow (New Guinea) (Figs. 39-40) ...A. papuana Taylor
-- The lateral 2 teeth of the anterior clypeal margin isolated. Mandibles rela-
tively broad (Indonesia) (Figs. 41-42) .........................A. minuta (Forel)
22 Anterior clypeal margin with 7 teeth. Anterolateral curve of clypeus with

Figs. 31-38. 31-32: Worker of Amblyopone triloba Xu; 31. Head and body in profile view; 32. Head in full-face view. (Drawn from Antweb images). 33-35: Worker of Amblyopone meiliana sp. nov.; 33. Head and body in profile view; 34. Head in full-face view; 35. Body in dorsal view. 36-37: Worker of Amblyopone noonadan Taylor; 36. Head and body in profile view; 37. Head in full-face view. (Drawn from Antweb images). 38: Worker of Amblyopone amblyops (Karavaiev), head in full-face view. (Cited from Karavaiev, 1935, slightly modified)
a tooth ................................................................................................................ 23
-- Anterior clypeal margin with 8 teeth. Anterolateral curve of clypeus without a tooth ................................................................................................................ 24

23 In full-face view, head weakly longer than broad. Eyes present. Anterior clypeal teeth isolated, not pairly combined. In profile view, anterodorsal corner of petiolar node rounded, subpetiolar process roughly rectangular (Israel) (Figs. 43-44) ...................................... *A. ophthalmica* Baroni Urbani

-- In full-face view, head strongly longer than broad. Eyes absent. Anterior

---

Figs. 39-46. 39-40: Worker of *Amblyopone papuana* Taylor; 39. Head and body in profile view; 40. Head in full-face view. (Drawn from Antweb images). Figs. 41-42: Worker of *Amblyopone minuta* (Forel); 41. Head and body in profile view; 42. Head in full-face view. (Drawn from Antweb images). 43-44: Worker of *Amblyopone ophthalmica* Baroni Urbani; 43. Head and body in profile view; 44. Head in full-face view. (Drawn from Antweb images). 45-46: Worker of *Amblyopone boltoni* Bharti et Wachkoo; 45. Head and body in profile view; 46. Head in full-face view. (Drawn from Antweb images)
clypeal teeth pairly combined at base. In profile view, anterodorsal corner of petiolar node bluntly angled, subpetiolar process triangular (India) (Figs. 45-46) ...................................................... A. boltonii Bharti et Wachkoo

24 Anterior clypeal teeth pairly combined at base .............................................. 25

-- Anterior clypeal teeth isolated, not pairly combined at base ................. 27

25 Dorsolateral sides of alitrunk and petiole strongly margined (Philip-

pines) (Figs. 47-48)...............................

--- Dorsolateral sides of alitrunk and petiole rounded, not margined ..... 26

26 In profile view, anterodorsal corner of petiolar node acutely angled, anterior face weakly concave, dorsal face straight (China: Zhejiang and Taiwan; Korea Peninsula, Japan) (Figs. 49-50) ......................

--- In profile view, anterodorsal corner of petiolar node rightly angled, anterior face straight, dorsal face weakly convex (China: Yunnan and Tibet) (Figs. 51-56) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................

--- Anterior clypeal margin roundly convex, the clypeal teeth decreased in length from middle to lateral sides (Turkmenia) (Fig. 57) ........................................................................................................

--- Anterior clypeal margin straight, the clypeal teeth with the similar length.................................................................................................................. 28

28 In full-face view, occipital corners rounded, lateral sides of head nearly straight. In profile view, posterodorsal corner of propodeum rounded. Anterior face of petiolar node straight (China: Yunnan) (Figs. 58-59) ....

--- In full-face view, occipital corners prominent, lateral sides of head evenly convex. In profile view, posterodorsal corner of propodeum bluntly angled. Anterior face of petiolar node weakly concave (China: Taiwan) (Figs. 60-61) .................................................................
DESCRIPTIONS OF NEW SPECIES AND SUPPLEMENTARY MEASUREMENTS FOR A. OCTODENTATA

Amblyopone kangba sp. nov.  
(Figs. 13-15)

Holotype worker: TL 6.7, HL 1.40, HW 1.40, CI 100, SL 0.80, SI 57, ED 0.10, ML 1.17, PW 0.93, AL 2.07, PL 0.70, PH 0.87, DPW 0.80, LPI 124, DPI 114.

In full-face view, head square, as broad as long, slightly widened forward. Occipital margin weakly widely concave, occipital corners bluntly angled. Lateral sides nearly straight. Anterolateral corners each with a reduced tiny tooth. Mandibles elongate and linear, masticatory margin very short, about 1/4 length of the inner margin, with 3 simple teeth; inner margin with 2 rows of curved teeth, each row with 6 teeth, the basal tooth large and triangular. Middle portion of anterior clypeal margin weakly protruding forward, slightly concave, with 4 tiny short rectangular denticles; anterolateral corners rightly angled. Frontal lobes slightly surpassed anterior clypeal margin. Antennae short, 12-segmented; apices of scapes reached to 2/3 of the distance from antennal sockets to occipital corners; funiculi incrassate toward apices. Eyes small, located behind the midpoints of the lateral sides of head, each with about 9 facets.

In profile view, dorsum of alitrunk weakly convex, promesonotal suture distinctly notched. Mesonotum short and convex. Metanotal groove absent. Dorsum of propodeum nearly straight, about 1.5 times as long as declivity, posterodorsal corner rounded, declivity weakly convex. Dorsal face of petiole weakly convex, anterior face straight, anterodorsal corner bluntly

Figs. 60-61: Worker of Amblyopone zaojun Terayama; 60. Head and body in profile view; 61. Head in full-face view. (Cited from Terayama, 2009, slightly modified)
angled; ventral face oblique and weakly concave, subpetiolar process roughly square, with a circular sub-transparent fenestra. Constriction between the two basal gastral segments distinct, sting strong and extruding.

In dorsal view, mesothorax constricted, mesonotum very short. Propodeal declivity weakly concave. Petiole broader than long, width : length = 1.2:1.

Mandibles longitudinally striate. Head with fine elongate reticulations. Dorsal faces of alitrunk, petiole, and gaster sparsely punctured, the punctures decreased in diameter from alitrunk to gaster, interfaces smooth and shining. The longitudinal middle strip of pronotum without punctures. Lateral sides of alitrunk, petiole, and gaster densely punctured; lateral sides of mesothorax and metathorax longitudinally striate. Dorsal surfaces of head and body with abundant suberect short hairs and dense decumbent pubescence. Scapes and hind tibiae with sparse suberect hairs and dense decumbent pubescence. Color reddish brown. Occiput blackish brown. Antennae and legs yellowish brown.

**Paratype workers:** TL 6.5-7.0, HL 1.33-1.40, HW 1.33-1.40, CI 100-102, SL 0.77-0.83, SI 57-60, ED 0.07-0.08, ML 1.17-1.23, PW 0.87-0.97, AL 1.93-2.07, PL 0.67-0.77, PH 0.87-0.90, DPW 0.78-0.83, LPI 117-130, DPI 109-118 (4 individual measured). As holotype, but middle portion of anterior clypeal margin with 4-6 tiny rectangular denticles; Color yellowish brown to reddish brown.

**Holotype:** worker, China: Tibet, Zayu County, Zhuwagen Town, Cibaqiao, 1750m, 2010.VIII. 30, collected from a soil sample in the forest of *Pinus yunnanensis* (Pinaceae), Xia Liu leg., No.A10-3405.

**Paratypes:** 2 workers, with the same data as holotype; 2 workers, China: Yunnan Province, Xichou County, Xisa Town, Jiaokui Village, 1480m, 2010. III.31, collected from a soil sample in the forest of *Cyclobalanopsis glaucoides* (Fagaceae), Zheng-Hui Xu leg., No.A10-1763.

**Comparison notes:** This new species is close to *A. rubiginoa* Wu et Wang, but in full-face view, occipital margin widely weakly concave, occipital corners bluntly angled; in profile view, subpetiolar process roughly square.

**Etymology:** The new species is named after a race of the Tibetan people “Kangba” who live in the southwestern Tibet.
Amblyopone zona sp. nov.
(Figs. 28-30)

Holotype worker: TL 4.5, HL 1.00, HW 0.85, CI 85, SL 0.48, SI 56, ED 0.05, ML 0.68, PW 0.58, AL 1.25, PL 0.48, PH 0.55, DPW 0.55, LPI 116, DPI 100.

In full-face view, head roughly trapezoidal, widened forward and longer than broad. Occipital margin widely weakly concave, occipital corners blunly angled. Lateral sides weakly convex. Anterolateral corners acutely toothed. Mandibles elongate triangular, masticatory margin with a long apical tooth, a short subapical tooth, and 3 pairs of curved teeth; inner margin about as long as masticatory margin, with a pair of curved teeth, a short subbasal tooth, and a large basal tooth. Anterior clypeal margin roughly triangularly protruding, with a large middle lobe, and 3 teeth on each side, the most lateral tooth large and lobe-like; the large middle lobe truncated at apex, with a small denticle on each side. Antennae short, 12-segmented; apices of scapes reached to 4/7 of the distance from antennal sockets to occipital corners; funiculi incrassate toward apex. Eyes small, each with about 6 facets, and located behind the midpoints of the lateral sides of head.

In profile view, pronotum weakly convex. Promesonotal suture deeply notched. Mesonotum short and convex. Metanotal groove absent. Propodeal dorsum straight, about 1.5 times as long as declivity; posterodorsal corner very blunly angled; declivity nearly straight. Dorsal and anterior faces of petiole nearly straight, anterodorsal corner nearly rightly angled; ventral face oblique and weakly concave; Subpetiolar process roughly rectangular, with a large elliptical sub-transparent fenestra, anteroventral corner prominent, ventral face straight, posteroventral corner toothed. Sternite of the first gastral segment ill developed, anteroventral corner toothed, and the segment looks narrower.

In dorsal view, mesothorax constricted. Propodeum widened backward. Petiole broader than long, width : length = 1.2:1, anterior and lateral sides weakly convex.

Mandibles longitudinally striate. Head densely punctured, interfaces appear as micro-reticulations. Pronotum densely punctured. Mesonotum, propodeum, petiole, and first gastral segment abundantly punctured. The

**Holotype:** worker, China: Tibet, Medog County, Beibeng Town, Gangouhe, 740m, 2011.VII.19, collected from a soil sample in the valley tropical rainforest, Zheng-Hui Xu leg., No. A11-3676.

**Comparison notes:** This new species is close to *A. triloba* Xu, but in full-face view, occipital corners bluntly angled; eyes present, each with about 6 facets; anterior clypeal margin with 2 simple teeth between the middle and lateral lobes; the middle lobe truncated at apex, and with a small denticle on each side; the lateral lobes simple, not bifid at apex.

**Etymology:** The new species is named after a common female name “Zoma” widely used in Tibet.

*Amblyopone meiliana* sp. nov.  
(Figs. 33-35)

**Holotype worker:** TL 4.9, HL 1.10, HW 0.95, CI 86, SL 0.63, SI 66, ED 0.05, ML 0.78, PW 0.63, AL 1.50, PL 0.53, PH 0.60, DPW 0.60, LPI 114, DPI 100.

In full-face view, head roughly trapezoidal, widened forward and longer than broad. Occipital margin widely weakly concave, occipital corners rounded. Lateral sides nearly straight, anterolateral corners acutely toothed. Mandibles elongate, masticatory margin about as long as inner margin, with a long apical tooth, a short subapical tooth, and 3 pairs of curved teeth; inner margin with a pair of curved teeth, a short subbasal tooth, and a large basal tooth. Anterior clypeal margin roundly convex, with a broad middle lobe, a narrow lobe on each side, and a simple tooth between the middle and lateral lobes; the broad middle lobe with 4 denticles at apex, the lateral lobes slightly bifid at apices. Antennae short, 12-segmented; apices of scapes reached to 2/3 of
the distance from antennal sockets to occipital corners; funiculi incrassate toward apex. Eyes small, each with 5 facets, and located well behind the midpoints of the lateral sides of head.

In profile view, posterior 2/3 of pronotum nearly straight, mesonotum short and convex. Promesonotal suture distinctly notched, metanotal groove weakly depressed. Propodeal dorsum straight, about 1.5 times as long as declivity, posterodorsal corner rounded, declivity nearly straight. Petiole roughly trapezoidal, dorsal and anterior faces nearly straight, anterodorsal corner rounded; ventral face oblique and weakly concave. Subpetiolar process nearly triangular, with a large circular sub-transparent fenestra, anterior face rounded, ventral face straight, posterovertrnal corner rightly angled.

In dorsal view, mesothorax constricted. Propodeum widened backward. Petiole slightly broader than long, width : length = 1.1:1, anterior and lateral sides weakly convex.


**Holotype:** worker, China: Yunnan Province, Deqin County, Yunling Town, Mingyong Village, 3250m, 2004.X.10, collected from a ground sample in the conifer-broad leaf mixed forest on the east slope of the Snow Mt. Meili, Sheng-Li Shi leg., No. A04-536.

**Comparison notes:** This new species is close to *A. triloba* Xu, but in full-face view, occipital margin widely weakly concave, occipital corners more prominent; lateral sides of head nearly straight; eyes present, each with 5 facets; in profile view, subpetiolar process roughly triangular.

**Etymology:** The new species is named after the type locality “Snow Mt. Meili”, the highest mountain in Yunnan Province.
Amblyopone awa sp. nov.
(Figs. 51-56)

Holotype worker (Figs. 51-53): TL 3.8, HL 0.80, HW 0.68, CI 84, SL 0.40, SI 59, ED 0.03, ML 0.55, PW 0.45, AL 1.05, PL 0.38, PH 0.43, DPW 0.43, LPI 113, DPI 113.

In full-face view, head roughly trapezoidal, widened forward and longer than broad. Occipital margin widely weakly concave, occipital corners bluntly angled. Lateral sides weakly convex, anterolateral corners acutely toothed. Mandibles elongate, masticatory margin with a long apical tooth, a short subapical tooth, and 3 pairs of curved teeth; inner margin about as long as masticatory margin, with a pair of curved teeth, a short subbasal tooth, and a large basal tooth. Anterior clypeal margin with 8 teeth, which combined into 4 pairs. Antennae short, 12-segmented; apices of scapes reached to about 2/3 of the distance from antennal sockets to occipital corners; funiculi incrassate toward apex. Eyes very small, each with 3 facets, and located well behind the midpoints of the lateral sides of head.

In profile view, pronotum weakly convex. Promesonotal suture distinctly notched. Mesonotum short and convex. Metanotal groove absent. Propodeal dorsum straight, about 2 times as long as declivity, posterodorsal corner rounded, declivity weakly convex. Petiole trapezoidal, dorsal and anterior faces nearly straight, anterodorsal corner close to a rightly angle; ventral face oblique, nearly straight; subpetiolar process roughly rectangular, with a large elliptical sub-transparent fenestra, ventral face straight, posteroventral corner rightly angled.

In dorsal view, mesothorax constricted. Propodeum slightly widened backward. Propodeal declivity longitudinally concave. Petiole broader than long, width : length = 1.25:1, anterior and lateral sides weakly convex.

Mandibles longitudinally striate. Head densely punctured, interfaces appear as micro-retticulations. Pronotum densely punctured, the narrow longitudinal middle strip without punctures. Dorsa of mesonotum and propodeum abundantly punctured. Lateral sides of mesothorax and metathorax finely longitudinally striate. Petiole and gaster finely sparsely punctured. Dorsal surfaces of head and body with sparse suberect short hairs and dense decumbent pubescence. Scapes with sparse suberect hairs and dense decumbent pubes-

**Paratype workers:** TL 3.6-4.2, HL 0.78-0.90, HW 0.65-0.75, CI 81-90, SL 0.40-0.48, SI 57-63, ED 0.03-0.04, ML 0.53-0.60, PW 0.43-0.50, AL 1.03-1.20, PL 0.38-0.45, PH 0.43-0.48, DPW 0.41-0.48, LPI 106-113, DPI 103-113 (5 individuals measured). As holotype, but eyes with 3-6 facets; posterolateral margin of subpetiolar process toothed or bluntly angled; head and alitrunk reddish brown to bluish brown.

**Paratype queens (Figs. 54-56):** TL 4.0-4.1, HL 0.80-0.85, HW 0.70-0.75, CI 88, SL 0.40-0.43, SI 57, ED 0.13, ML 0.55-0.68, PW 0.53-0.55, AL 1.18-1.25, PL 0.40-0.45, PH 0.45-0.48, DPW 0.45-0.48, LPI 106-113, DPI 106-113 (2 individuals measured). Similar to holotype worker, but body feebly larger, vertex with 3 ocelli. Eyes large, each with about 45 facets. Mesonotum large in volume, tegulae present. In dorsal view, anterior margin of mesonotum roundly convex, scutum with a pair of posteriorly convergent longitudinal furrows, posterior margin roundly convex. Scutellum rhombus, both anterior and posterior margins roundly convex. Metascutum narrow and posteriorly arched. In profile view, posterolateral margin of subpetiolar process acutely toothed.

**Holotype:** worker, China: Yunnan Province, Cangyuan County, Banlao Town, Huguang Village, 1720m, 2011.III.17, collected from a soil sample in the monsoon evergreen broad-leaf forest, Yong-Qiang Hao leg., No. A11-855.

**Paratypes:** 1 worker, 1 queen, with the same data as holotype; 1 worker, China: Yunnan Province, Cangyuan County, Banchong Town, Nanban Village, 1250m, 2011.III.17, collected from a ground sample in the monsoon evergreen broad-leaf forest, Yong-Qiang Hao leg., No. A11-927; 1 worker, China: Yunnan Province, Ximeng County, Lisuo Town, Nankang Village, 740m, 2011.III.22, collected from a soil sample in the valley tropical rainforest, Li Zhang leg., No. A11-1671; 2 workers, 1 queen, China: Tibet, Linzhi County, Lulang Town, Zhaqu Village, 2380m, 2007.IX.25, collected inside decayed wood in the broad-leaf forest, Zheng-Hui Xu leg., No. A07-432.

**Comparison notes:** This new species is close to *A. silvestrii* (Wheeler), but in profile view, anterodorsal corner of petiolar node rightly angled, anterior face straight, dorsal face weakly convex; body smaller with TL 3.6-4.2 mm.
**Etymology:** The new species is named after an intimate call “Awa” of the minority nationality “Wa” people who commonly live in the area of the holotype locality.

*Amblyopone octodentata* Xu

(Figs. 58-59)

**Workers:** TL 4.8-5.8, HL 1.03-1.38, HW 0.90-1.13, CI 82-91, SL 0.55-0.75, SI 58-67, ED 0.04-0.08, ML 0.75-1.10, PW 0.60-0.75, AL 1.38-1.70, PL 0.55-0.68, PH 0.58-0.68, DPW 0.53-0.68, LPI 100-114, DPI 95-109 (10 individuals measured). Well conform to the original description.

**Specimens observed:** 9 workers, China: Yunnan Province, Zhenxiong County, Wufeng Town, Shangjie Village, 1750m, 2009.IV.01, collected from a ground sample in the forest of *Cunninghamialanceolata* (Taxodiaceae), Zhi-Feng Chen leg., No. A09-1322; 1 worker, China: Yunnan Province, Yongshan County, Xisha Town, Yangpu Village, 1000m, 2009.III.26, collected from a soil sample in the deciduous broad-leaf forest, Li-Mei Li leg., No. A09-735.

**ACKNOWLEDGMENTS**

This study is supported by the National Natural Science Foundation of China (Nos. 30260016, 30870333), Rapid Assessment Program of Biodiversity organized by Peking University, and the Key Subject of Forest Protection of Yunnan Province.

We thank the following persons or Institutions for their special help in this study: Miss Xia Liu (PhD Candidate of Forest Protection, Beijing Forestry University, Beijing), Mr. Sheng-Li Shi (Postgraduate of Forest Protection, Southwest Forestry University, Kunming), Miss Li-Mei Li & Mr. Zhi-Feng Chen (Students of Forest Protection Class 2005, Southwest Forestry University, Kunming), Miss Li Zhang & Mr. Yong-Qiang Hao (Students of Forest Protection Class 2007, Southwest Forestry University, Kunming) who collected the type specimens with us; Mr. Himender Bharti (Punjabi University, Patiala) who supplied a valuable paper; Mr. Konstantin Vladamirovitsch Arnol’di (Anim. Acad. Sci. USSR, Moscow), Mr. Cesare Baroni Urbani (Naturhistorisches Museum, Basel), Mr. Vladimir Aphanasjevich Karavaiey (Conservator of the Zoological Museum of the Ukranian Academy of Science in Kiew), Mr. Hirotami T. Imai et al. (Myrmecological Society of Japan,
REFERENCES


