

Short communication

New Cretaceous palaeontinids (Insecta, Hemiptera) from northeast China

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ABSTRACT

Two new species, *Ilerdocossus dissidens* sp. nov., and *Miracossus gongi* sp. nov., and 10 new specimens assigned to known species of Palaeontinidae are described and discussed. All these specimens were collected from the Lower Cretaceous Yixian Formation of Inner Mongolia and western Liaoning. *I. dissidens* sp. nov., is different from other species of the genus in possessing a forewing with outer margin dentate; vein MP_{1+2} bifurcating distal of the level of indentation; MP_{3+4} bifurcating basal of the level of indentation; vein CuA_1 slightly curved anteriorly; branch CuA_2 curved posteriorly then recurved. *M. gongi* sp. nov., is different from the type species in having a smaller forewing with different colour pattern.

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1. Introduction

Palaeontinidae is an extinct family of hemipterous insects from the Triassic (Carnian) to Cretaceous (Aptian) (Szwedo, 2018), it was originally placed in the order Lepidoptera (Butler, 1873; Handlirsch, 1906), and later transferred to Homoptera (Hemiptera) by Tillyard (1921). The first unequivocal palaeontinid in China was reported by Hong (1982) based on an isolated hindwing. During the past 20 years, abundant and well-preserved palaeontinids have been discovered and described from Middle Jurassic and Lower Cretaceous of China (Ren et al., 1998; Wang Y and Ren., 2006, 2007; Wang Y et al., 2012; Wang B et al., 2007a, 2007b, 2008a, 2008b; Chen et al., 2014, 2016) and the number of specimens for study has risen to 1000 (Wang B et al., 2010). Up to now, all Chinese palaeontinids come from northern China and this family is more diverse than any other hemipterous family in the Mesozoic of China (Wang B et al., 2010).

So far, Cretaceous palaeontinids, belonging to more than 30 species within 12 genera, have been discovered from Spain, Russia, China, England and Brazil (Handlirsch, 1906; Martynov, 1926; Gómez-Pallerola, 1984; Whalley and Jarzembowski, 1985; Shcherbakov, 1988, 2002; Ren, 1995; Ueda, 1996, 2008; Ren, 1998; Martins-Neto, 1998; Menon and Heads, 2005; Menon et al., 2005; Wang B et al., 2008c). Ten species within five genera have been reported from the Lower Cretaceous of northern China (Hong, 1982, 1984; Ren, 1995; Ren et al., 1998; Wang B et al., 2008b). Herein, two new species referable to *Ilerdocossus* Gómez-Pallerola 1984 and *Miracossus* Ren et al., 1998 and several new materials assigned to known species from Inner Mongolia and Liaoning in China are described and discussed.

2. Material and methods

Of the specimens, five were collected from Yangshuwan Village (4125'N, 11857'E), Ningcheng County, Chifeng City, Inner Mongolia, China, and are preserved on the surface of yellow mudstone; four were collected from Xisanjia Village (4119'57"N, 11907'40"E), Ningcheng County, Chifeng City Inner Mongolia, China, and only

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preserved as body on the surface of grey-green tuffaceous mud shale; two were from Liutiaogou Village (4131.918°N, 11855.527°E), Ningcheng County, Chifeng City, Inner Mongolia, China. Two were from Sihetun Village (4135.348°N, 12047.596°E), Beipiao County, Chaoyang City, Liaoning Province, China (Fig. 1). All these specimens were collected from the Yixian Formation. Based on previous age reports, the Yixian Formation was deposited around 125 Ma, i.e., near the Barremian–Aptian boundary, in the Early Cretaceous (Swisher et al., 1999, 2002; Sha, 2007; Chang et al., 2009).

The wing venation nomenclature of Palaeontinidae used in this paper is based on the interpretations by Wang B. et al. (2009) and Nel et al. (2012). Specimens were examined by a Nikon SMZ100 stereomicroscope and the photographs were prepared by a Nikon D100 digital camera. The line drawings were readjusted on photographs using image-editing software (Coreldraw 2017 and Adobe Photoshop CS). In drawings, dashed lines denote the nodal line in the forewing, gray solid lines indicate faintly seen and hypothesized missing veins, and thin solid lines indicate the edges of missing or obscured regions.

All specimens except the specimen STMN48-1001 are deposited in the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Science. The specimen STMN48-1001 is deposited in the Shandong Tianyu Museum of Nature (STMN) at Pingyi, Shandong, China.

All taxonomic acts established in the present work have been registered in ZooBank (see below), together with the electronic

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3. Systematic Palaeontology

Order: Hemiptera Linnaeus, 1758

Infraorder: Cicadomorpha Evans, 1946

Superfamily: Palaeontinoidea Handlirsch, 1906

Family: Palaeontinidae Handlirsch, 1906

Genus *Ilerdocossus* Gómez-Pallerola, 1984

Type species: *Ilerdocossus villaltai* Gómez-Pallerola, 1984; by original designation.

Type horizon and locality. Caliza con Caraceas Formation, Lower Cretaceous; Sierra del Montsec, Lérida, Spain.

Species included. Nine species, *I. villaltai* and *I. pulcherrima* (Whalley and Jarzembowski, 1985) from the Lower Cretaceous of Spain, *I. hui* (Ren et al., 1998), *I. beipiaoensis* (Ren et al., 1998) and *I. exiguus* (Ren et al., 1998) from the Lower Cretaceous of Liaoning, China, *I. fengningensis* (Ren et al., 1998) from the lower Cretaceous of Fengning, Hebei, China, *I. pingquanensis* (Ren et al., 1998) from the Lower Cretaceous of Pingquan, Hebei, China, and *I. ningchengensis* (Wang B et al., 2008b) from the Lower Cretaceous of Inner Mongolia, China, and new species *I. dissidens* sp. nov. from the Lower Cretaceous of Inner Mongolia, China.

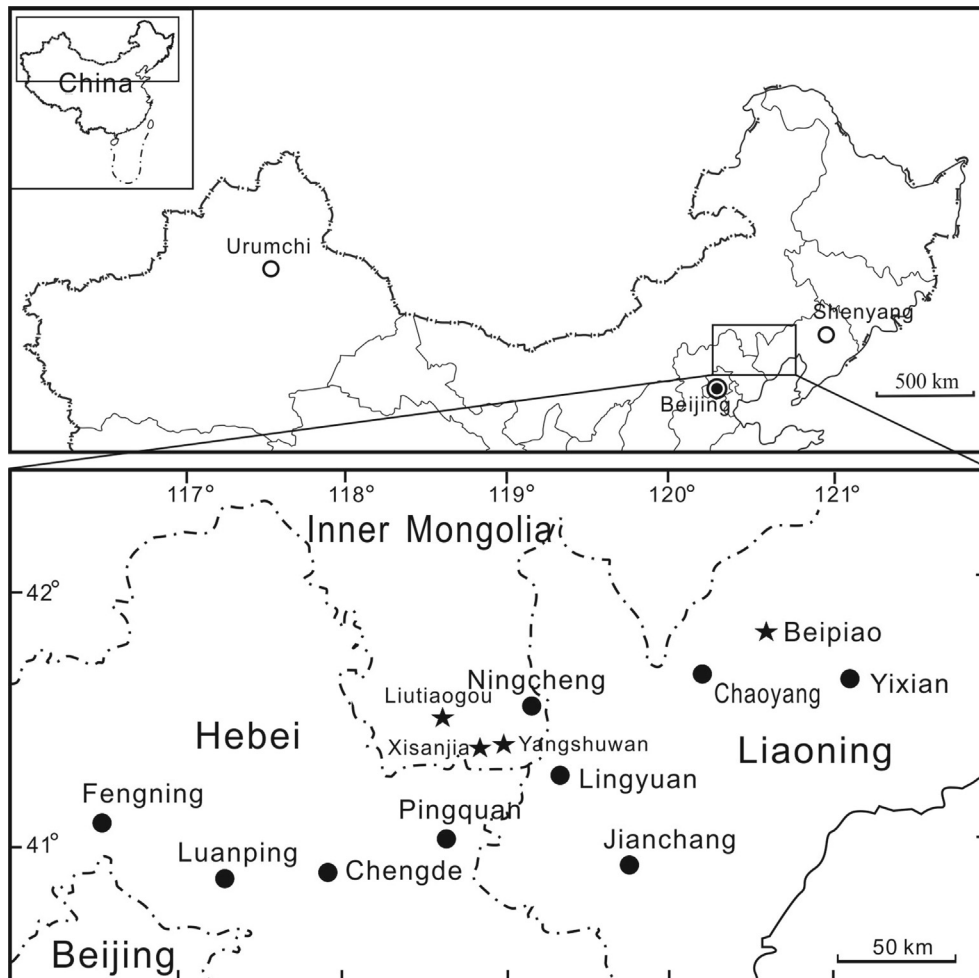


Fig. 1. Map showing the location of insect fossil localities.

Ilerdocossus dissidens sp. nov.

Figs. 2 and 3

LSID urn:lsid:zoobank.org:act:E4D7DCF0-347C-4B18-AFE3-96EE3B5FDEFF.

Derivation of name. Specific epithet is from the Latin *dissidens* for the forewing outer margin dentate.*Holotype.* NIGP154989a and NIGP154989b (part and counterpart), deposited in the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences; Yixian Formation, Lower Cretaceous;

Yangshuwan Village, Ningcheng County, Chifeng City, Inner Mongolia, China.

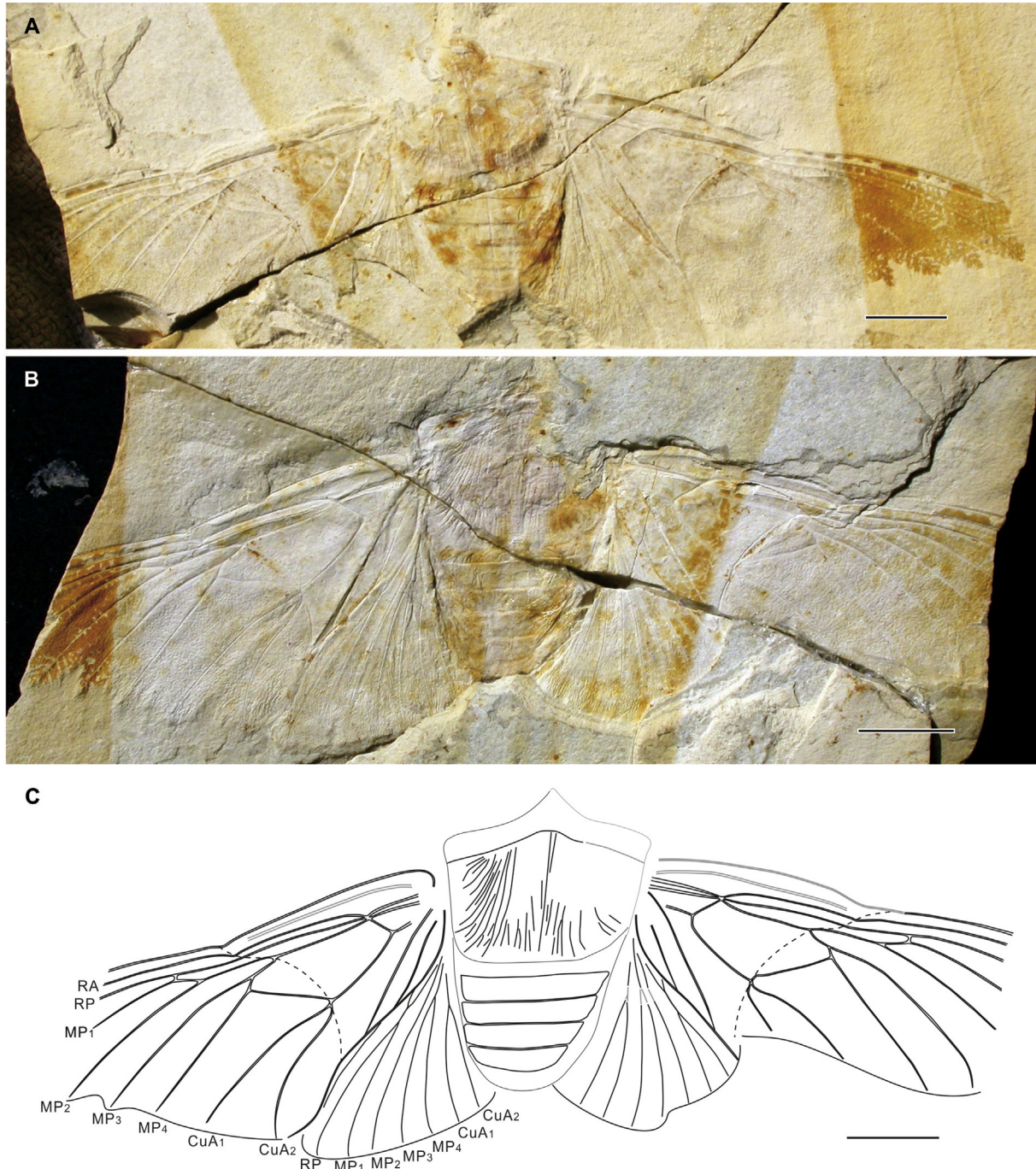
Diagnosis. Body robust, with a very long rostrum extending to the abdomen that. Head small, pronotum wide, mesonotum with about 20 longitudinal carinae. Forewing triangular and large-sized; outer margin dentate; vein MP_{1+2} bifurcating distal of the level of indentation; MP_{3+4} bifurcating basal of the level of indentation; vein CuA_1 slightly curved anteriorly; branch CuA_2 curved posteriorly then recurved. The membrane is spitted with delicate punctuations.

Fig. 2. *Ilerdocossus dissidens* sp. nov., holotype NIGP154989; Yangshuwan, Lower Cretaceous. A, Photograph of NIGP154989a. B–C, Photograph and camera lucida drawing of NIGP154989b. Scale bars represent 10 mm.

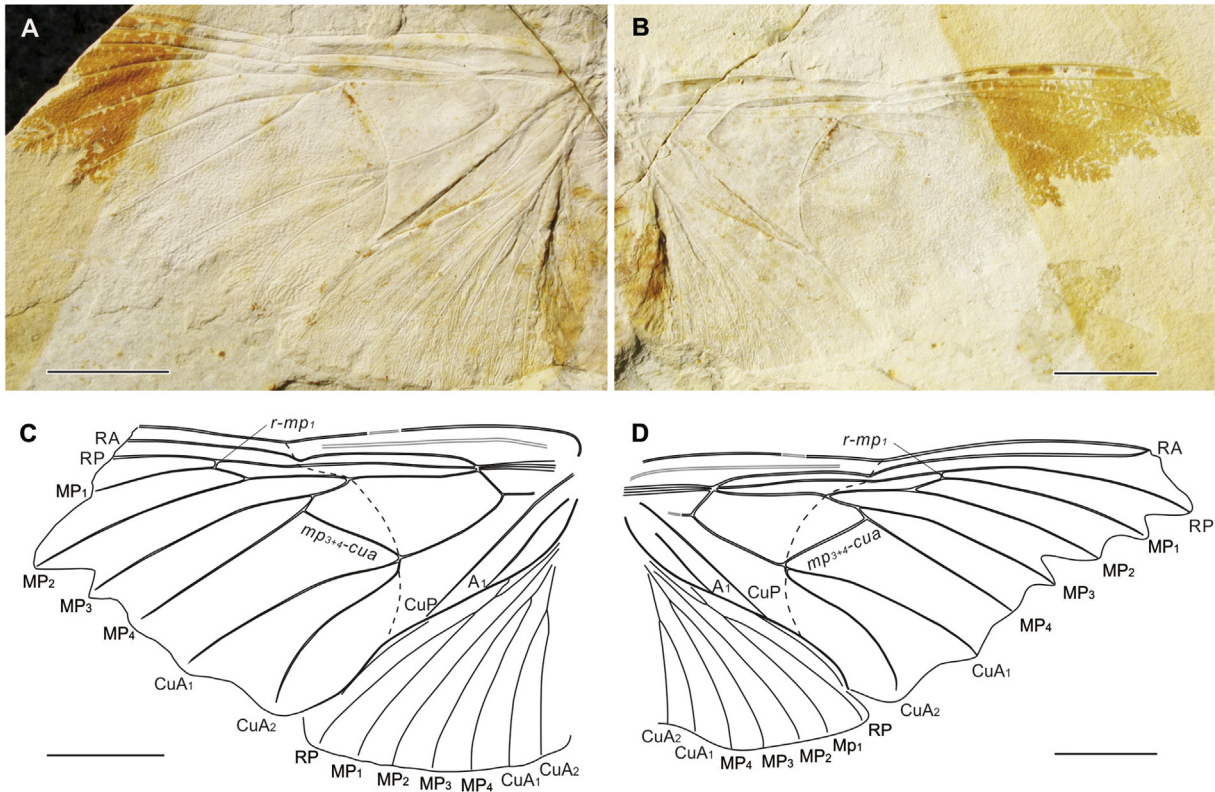


Fig. 3. *Ilerdocossus dissidens* sp. nov., holotype NIGP154989; Yangshuwan, Lower Cretaceous. A, C, Photograph and camera lucida drawing of the left forewing of NIGP154989b. B, D, Photograph and camera lucida drawing of the right forewing of NIGP154989a. Scale bars represent 10 mm.

Description. Adult with a pair of incomplete forewings preserved at each side of the body and a pair of hindwings. Body robust, length 33 mm, width 20 mm, with a very long rostrum extending to the abdomen. Head small. Pronotum wide. Thorax is partly covered by mesonotum. Mesonotum wide, length about 14 mm, width about 17 mm, with about 20 longitudinal carinae. Abdomen pointed posteriorly, length about 13 mm, 7 segments visible.

Forewing triangular, length 53 mm, width 30 mm. Costal margin slightly curved anteriorly. Outer margin dentate. Nodal indentation distinct, at about basal 0.49 wing length. Vein Sc arising basally, fused with stem R+MP at basal 0.17 wing length. Stem R+MP almost straight, connected to branch CuA by crossvein *r+mp-cua*. Crossvein *r+mp-cua* long, oblique, and meeting stem R+MP at vein Sc fused with stem R+MP. Branches RA, RP and MP departing from stem R+MP at the same point where vein Sc fused with stem R+MP. Branch RA slightly curved anteriorly, and recurved at nodal line; subparallel to anterior margin after nodal line. Branch RP connected to branch MP₁ by short crossvein *r-mp₁* distal of the level of indentation. Stem MP slightly curved posteriorly, dividing into MP₁₊₂ and MP₃₊₄ at basal 0.38 wing length. Nodal line coalesced with the stem of MP₁₊₂ for a distance. Branch MP₁₊₂ branching into veins MP₁ and MP₂ distal of the level of indentation. Branch MP₃₊₄ branching into MP₃ and MP₄ just basal of the level of indentation. Branch MP₄ directed posteriorly. Branch MP₃ slightly curved anteriorly. Crossvein *mp₄-cua* long. Stem Cu branching into veins CuA and CuP at basal wing. Branch CuA distinctly angled at junction with crossvein *r+mp-cua*, slightly curved posteriorly between crossveins *r+mp-cua* and *mp₄-cua*, branching into veins CuA₁ and CuA₂ at crossvein *mp₄-cua* basal of the level of the nodal indentation. Branch CuA₁ and CuA₂ long; branch CuA₁ slightly curved anteriorly, branch CuA₂ curved posteriorly then recurved. Discal cell with delicate punctuations,

length 15 mm, width 9 mm at nodal line, about one-third of wing length; antenodal region trapezoid, length 13 mm; postnodal region less than half of antenodal region in length. Branch CuP long and straight. Nodal line traceable as a crease cross RA and RP to MP at its initial division, and then separating discal cell into two parts; it continuously crossing CuA at its initial division, following the base of CuA₂, and reaching the distal end of clavus. The membrane is spitted with small tubercles distal of the nodal line and with larger punctuations near the outer margin.

Hindwing obscure, length about 28 mm, width about 15 mm. Vein RP fused with branch MP₁ for a short distance. Stem MP with four branches. Vein MP₁₊₂ bifurcating at wing base, and vein MP₃₊₄ bifurcating basal of the level of the indentation.

***Ilerdocossus fengningensis* (Ren et al., 1998) Menon et al., 2005**
Figs. 4G–K

1998 *Liaocossus fengningensis*: Ren et al., pp. 226–227, figs. 8–11.
2008 *Ilerdocossus fengningensis*: Wang B et al., p. 553, fig. 2, 5A.

Holotype. HF95030 and HF95031 (part and counterpart); deposited in the National Geological Museum of China, Beijing; Yixian Formation, Lower Cretaceous; Xituyao Village, Fengning County, Hebei Province, China.

Other material. NIGP154990, Yixian Formation, Lower Cretaceous; Yangshuwan Village, Ningcheng County, Chifeng City, Inner Mongolia, China. NIGP154991a and NIGP154991b (part and counterpart), Yixian Formation, Lower Cretaceous; Liutiaogou Village, Ningcheng County, Chifeng City, Inner Mongolia, China. NIGP154992a and NIGP154992b (part and counterpart), Xisanjia Village, Ningcheng County, Chifeng City Inner Mongolia, China.

Description. Specimen NIGP154990. Adult with a pair of incomplete forewings preserved at each side of the body. Body poorly

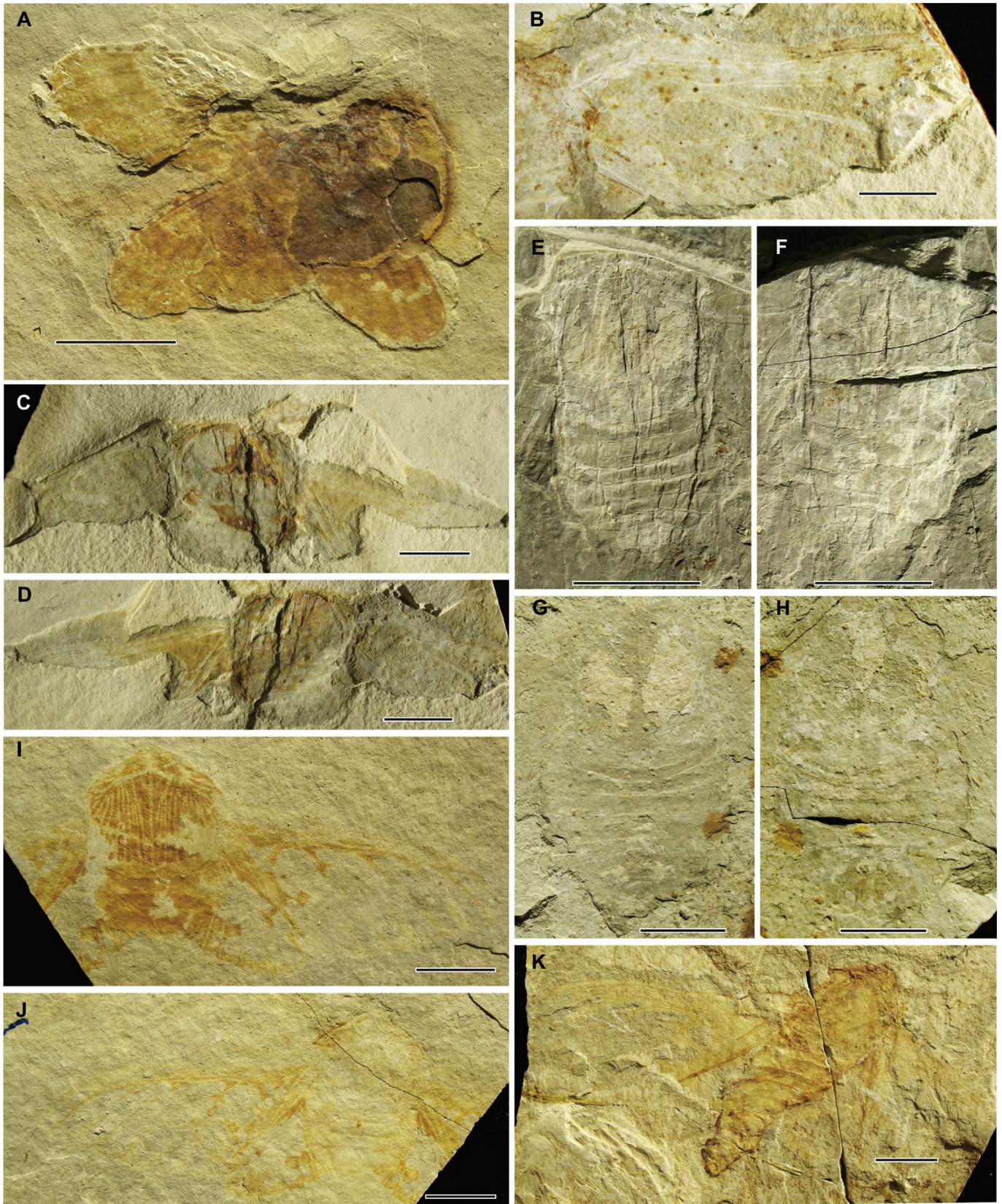


Fig. 4. Digital images. A-F, *Ilerdocossus hui* (Ren, Yin and Dou), A, NIGP154994; B, forewing of NIGP154993b; C, NIGP154993a; D, NIGP154993b; E, NIGP154995a; F, NIGP154995b. G-K, *Ilerdocossus fengningensis* (Ren, Yin and Dou), G, NIGP154992a; H, NIGP154992b; I, NIGP154991a; J, NIGP154991b; K, NIGP154990. A and C–K, Scale bars represent 10 mm; B, scale bars represent 5 mm.

preserved, slender and elongated, length 40 mm, width 18 mm. Head and thorax obscure and deformed. Thorax obscured by mesonotum. Mesonotum length about 12 mm, width about 8 mm. Abdomen length about 14 mm, with 5 visible segments. Forewing triangular, length 40 mm, width 18 mm. Nodal indentation distinct, at about basal 0.42 wing length. Nodal line coalesced with the stem of MP_{1+2} for a way. Branch MP_{1+2} branching into veins MP_1 and MP_2 distal of the level of indentation. Branch MP_{3+4} branching into MP_3 and MP_4 just basal of the level of indentation. Branch MP_3 slightly curved anteriorly. Crossvein mp_4-cua long. Hindwing obscure.

Specimens NIGP154991a and NIGP154991b (part and counterpart). Adult with a pair of incomplete forewings and a hindwing. Body robust, length 25 mm, width 18 mm. Thorax obscured by mesonotum. Mesonotum length about 13 mm, width about 16 mm, with about 20 longitudinal carinae. Abdomen pointed posteriorly, length about 11 mm, 4 segments visible. Forewing triangular, length 39 mm, width 17 mm. Nodal indentation distinct, at about basal 0.42 wing length. Vein Sc arising basally, fused with stem R+MP at basal wing. Stem R+MP connected to branch CuA by crossvein $r+mp-cua$. Crossvein $r+mp-cua$ long, and meeting stem R+MP at vein Sc fused with stem R+MP. Branches RA, RP and MP departing from stem R+MP at the same point where vein Sc fused with stem R+MP. Branch RP connected to branch MP_1 by short crossvein $r-mp_1$ distal of the level of indentation. Stem MP dividing into MP_{1+2} and MP_{3+4} at basal 0.33 wing length. Nodal line coalesced with the stem of MP_{1+2} for a way. Branch MP_{1+2} branching into veins MP_1 and MP_2 distal of the level of indentation. Branch MP_{3+4} branching into MP_3 and MP_4 just basal of the level of indentation. Crossvein mp_4-cua long. Stem Cu branching into veins CuA and CuP at basal wing. Branch CuA branching into veins CuA₁ and CuA₂ at crossvein mp_4-cua basal of the level of the nodal indentation. Branch CuA₁ and CuA₂ long. Discal cell length 10.8 mm, width 8.1 mm at nodal line, antenodal region trapezoid. Branch CuP long and straight. Hindwing obscure, length about 16 mm, width about 11 mm. Stem MP with four branches.

Specimens NIGP154992a and NIGP154992b (part and counterpart), body length 40 mm, width 22 mm. Abdomen length about 19 mm, 5 segments visible.

***Ilerdocossus hui* (Ren et al., 1998) Menon et al., 2005**

Figs. 4A–F

1998 *Liaocossus hui* Ren et al., pp. 223–224, figs. 1–3.

Holotype. part and counterpart, LB97104, LB97105; deposited in the National Geological Museum of China, Beijing; Yixian Formation, Lower Cretaceous; near Sihetun Village, Beipiao City, Liaoning Province, China.

Other material. NIGP154993a and NIGP154993b (part and counterpart), Yixian Formation, Lower Cretaceous; Yangshuwan Village, Ningcheng County, Chifeng City, Inner Mongolia, China. NIGP154994, Yixian Formation, Lower Cretaceous; Beipiao County, Chaoyang City, Liaoning Province, China. NIGP154995a and NIGP154995b (part and counterpart), Xisanjia Village, Ningcheng County, Chifeng City Inner Mongolia, China. All specimens are deposited in the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences.

Description. Specimens NIGP154993a and NIGP154993b (part and counterpart). Adult with a pair of incomplete forewings preserved at each side of the body. Body robust, length 19 mm, width 17 mm. Head and thorax obscure. Thorax obscured by mesonotum. Abdomen length about 9 mm, 5 segments visible. Forewing triangular, length as preserved 31 mm, width 12 mm. Costal margin

slightly curved anteriorly. Nodal indentation distinct, at about basal 0.49 wing length. Stem R+MP almost straight, connected to branch CuA by crossvein $r+mp-cua$. Crossvein $r+mp-cua$ long, oblique, and meeting stem R+MP at vein Sc fused with stem R+MP. Branches RA, RP and MP departing from stem R+MP at the same point where vein Sc fused with stem R+MP. Branch RP connected to branch MP_1 by short crossvein $r-mp_1$ distal of the level of indentation. Nodal line coalesced with the stem of MP_{1+2} for a way. Branch MP_{1+2} branching into veins MP_1 and MP_2 distal of the level of indentation. Branch MP_{3+4} branching into MP_3 and MP_4 just basal of the level of indentation. Crossvein mp_4-cua long. Stem Cu branching into veins CuA and CuP at basal wing. Branch CuA branching into veins CuA₁ and CuA₂ at crossvein mp_4-cua basal of the level of the nodal indentation. Branch CuA₁ and CuA₂ long; branch CuA₂ curved posteriorly. Discal cell length 9 mm, width 4 mm at nodal line; antenodal region trapezoid, length 3.5 mm. Nodal line traceable as a crease cross RA and RP to MP at its initial division, and then separating discal cell into two parts; it continuously crossing CuA at its initial division, following the base of CuA₂, and reaching the distal end of clavus. Hindwing obscure.

Specimens NIGP154995a and NIGP154995a (part and counterpart), body preserved as length 24 mm, width 13.5 mm; Head and thorax obscure. Thorax obscured by mesonotum. Abdomen length about 11 mm, 4 segments visible.

Genus *Miracossus* Ren et al., 1998

1998 *Miracossus*: Ren et al., p. 230, figs. 14–16

2008 *Miracossus*: Wang et al., p. 554, fig. 4

Type species: *M. ingentius* Ren et al., 1998; by original designation and monotypy.

Type horizon and locality. Yixian Formation, Lower Cretaceous; Shihetun Village, Beipiao City, Liaoning Province, China.

Revised diagnosis. vein Sc curved and unbranched; crossvein $r+mp-cua$ long and oblique; veins RA, RP and MP separating at one point; branch MP_{1+2} bifurcating at about basal 0.4 wing length; branch MP_4 vertical basally, and then geniculate at junction with crossvein mp_4-cua ; crossvein mp_4-cua longitudinal; discal cell about one-third of wing length; nodal line thick and S-shaped in discal cell; branch CuA strongly curved between crossveins $r+mp-cua$ and mp_4-cua , bifurcating basal of the level of the nodal indentation; branches CuA₁ and CuA₂ short; clavus narrow about one-third of wing length; vein CuP straight.

Hindwing small, with a small costal area. Vein RP connected to branch M_1 by a short crossvein $r-mp_1$; stem MP branching into veins MP_1 and MP_{2+3+4} basally; vein MP_{3+4} branching into veins MP_3 and MP_4 at the same level of crossvein $r-mp_1$; vein MP_4 connected to vein CuA just distal of crossvein $r-mp_1$.

Species included. Two species, *M. ingentius* (Ren et al., 1998) from the Lower Cretaceous of Liaoning, China, and new species *Miracossus gongi* sp. nov. from the Lower Cretaceous of Liaoning, China.

***Miracossus gongi* sp. nov.**

Fig. 5

LSID urn:lsid:zoobank.org:act:4065580B-D7E7-4C87-91BE-18F79FD555B3.

Derivation of name. After Baode Gong, the collector of this specimen.

Holotype. STMN48-1001, deposited in the Shandong Tianyu Museum of Nature (STMN) at Pingyi, Shandong, China; Yixian Formation, Lower Cretaceous; Shihetun Village, Beipiao County, Chaoyang City, Liaoning Province, China.

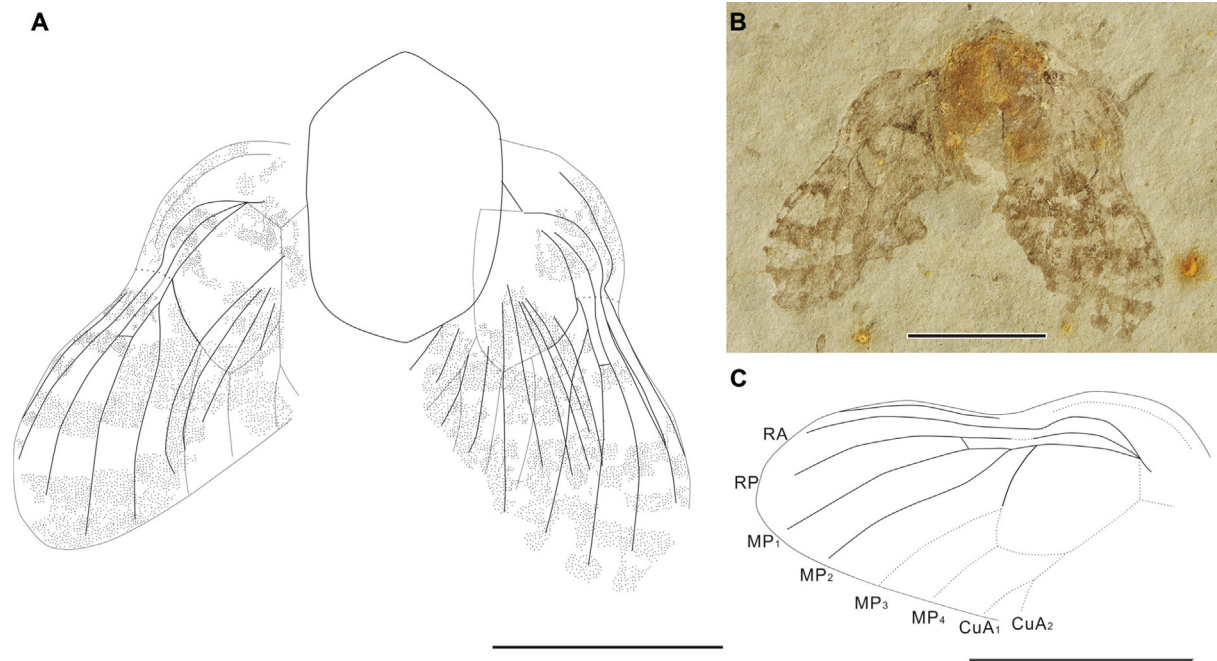


Fig. 5. *Miracossus gongi* sp. nov., holotype STMN48-1001; Beipiao, Lower Cretaceous. A–B. Photograph and camera lucida drawing of STMN48-1001. B, camera lucida drawing of the left forewing of STMN48-1001. Scale bars represent 10 mm.

Diagnosis. Forewing small-sized; Vein CP present. Stem MP slightly curved basally, bifurcating basal of the level of nodal indentation. Vein MP_{1+2} bifurcating at the same level of indentation. Branch MP_1 curved anteriorly; branch MP_2 curved posteriorly. Stem MP_{3+4} bifurcating just distal of the level of indentation. Discal cell about one-third of wing length. Branch CuA bifurcating basal of the level of the nodal indentation. clavus narrow. Veins CuP and A_1 absent. Membrane infusate with three vertical white bands.

Description. Adult with a pair of incomplete forewings and hindwings. Body obscure, length 11 mm. Forewings small-sized; partly covered by hindwings, preserved as length 20.5 mm, width 10 mm. Costal margin strongly curved anteriorly. Nodal indentation obscure, at about 0.43 wing length. Vein CP arise basally and curved at nodal line, extending to anterior margin. Vein Sc arising basally and unbranched, fused with stem R+MP at basal wing. Stem R+MP connected to branch CuA by crossvein $r+mp-cua$. Crossvein $r+mp-cua$ long. Branch RA strongly curved anteriorly, slightly recurved at nodal line, subparallel to costal margin after nodal line. Branch RP arched anteriorly and connected to branch MP_1 by long crossvein $r-mp_1$ at about middle of wing. Stem MP slightly curved basally, dividing veins into MP_{1+2} and MP_{3+4} basal of the level of nodal indentation. Branch MP_{1+2} branching into veins MP_1 and MP_2 at basal 0.44 wing length. Branch MP_1 curved anteriorly; branch MP_2 curved posteriorly. Stem MP_{3+4} dividing into veins MP_3 and MP_4 at basal 0.46 wing length. Branch CuA nearly straight between crossveins $r+mp-cua$ and mp_4-cua , and then branching into veins CuA_1 and CuA_2 basal of the level of indentation. Branches CuA_1 and CuA_2 short. Discal cell large, length 7.5 mm, width 4.7 mm nodal line is obscure. clavus narrow. Veins CuP and A_1 absent. Membrane infusate with three vertical white bands. Hindwing obscure in wing base, with a small costal area, preserved as length 12 mm, width 9 mm. Crossvein obscure, RP not coalesced with MP_1 ; MP with four branches; MP_3 straight and long; CuA with two long branches; CuP and A_1 absent.

4. Discussion

Gómez-Pallerola (1984) erected the genus *Ilerdocossus* based on a forewing from the lower Cretaceous of Lérida, Sapain. Then, Whalley and Jarzembowski (1985) described a new genus, *Wonnacottella* based on another forewing from the same locality. Ren et al. (1998) established the genus *Liaocossus* based on both forewings and hindwings from the Lower Cretaceous of China. Menon et al. (2005) summarized and analyzed the Cretaceous palaeotinids from Spain, Russia, China and Brazil, and considered both *Wonnacottella* and *Liaocossus* to be the junior synonyms of *Ilerdocossus*. Wang B et al. (2008b) have revised the diagnosis of *Ilerdocossus*, and considered three genera (*Ilerdocossus*, *Wonnacottella*, and *Liaocossus*) belong to the same genus judging from the original photographs. After revision, only three unquestionable genera, consisting of *Ilerdocossus*, *Yanocossus* and *Miracossus*, have been reported from the Lower Cretaceous in China (Ren, 1995; Ren et al., 1998; Menon et al., 2005; Wang B et al., 2008b). Wang B (2008b) considered that *Yanocossus* and *Miracossus* probably form a monophyletic group, that is the sister group of the “*Ilerdocossus*-complex”. *Miracossus* and *Yanocossus* are similarly to *Ilerdocossus*, they both have a triangular forewing with narrow costal area, reduced clavus and separation of veins RA, RP and MP at the same point, but the shape of discal cell in the forewing is different. And our materials also prove and further support this view.

I. dissidens sp. nov. was placed in the genus *Ilerdocossus* based on the following features: forewing triangular; nodal indentation distinct, RA, RP and MP separate at the same point; costal area and clavus narrow; discal cell long; antenodal region trapezoid; the length of hindwing is about half the length of forewing. It most resembles *I. fengningensis* in having a forewing with a similar venation and size, but differs from the latter in possessing a forewing without colour patterns, postnodal region less than half of antenodal region in length, and vein MP_{1+2} bifurcating distal of the level of indentation and MP_{3+4} bifurcating basal of the level of

indentation. It differs from *I. pingquanensis* in possessing a forewing without colour patterns, vein MP_{1+2} bifurcating distal of the level of indentation; from *I. ningchengensis* in possessing a larger forewing and vein MP_{1+2} bifurcating distal of the level of indentation; from *I. exiguus* in possessing a larger forewing with nodal line coalesced with the stem of MP_{1+2} for a distance, postnodal region less than half of antenodal region in length; from *I. beipiaoensis* in having a forewing with vein MP_{3+4} bifurcating basal of the level of indentation and colour patterns different from *I. huiin* having a larger forewing.

We placed *M. gongi* sp. nov., in the genus *Miracossus* based on the based on the following features: forewing triangular; nodal indentation obscure; RA, RP and MP separate at the same point; costal area and clavus narrow; the length of hindwing is about half the length of forewing; discal cell wide. The new species is obviously different from the type species *M. ingentius* in having a much smaller forewing possessing a different colour patterns; vein MP_{1+2} branching into veins MP_1 and MP_2 at the same level of indentation; vein MP_{3+4} bifurcating basal of the level of indentation and branches CuA_1 and CuA_2 short.

5. Conclusions

Two new species, *Ilerdocossus dissidens* sp. nov., and *Miracossus gongi* sp. nov., and 10 new specimens assigned to known species of Palaeontinidae are described based on specimens from the Lower Cretaceous of Northeast China. The newly discovered fossils improve our knowledge of the taxonomy, diversity and the evolutionary history of Cretaceous palaeontinids.

Acknowledgements

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