

Five new species of the subfamily Ichneutinae (Hymenoptera: Braconidae) from China and Europe

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Key words: Braconidae; Ichneutinae; *Pseudichneutes*; *Ichneutes*; new species; keys; Palaearctic; Oriental; China; Europe; Bulgaria; Yugoslavia.

The species of the genus *Pseudichneutes* Belokobylskij, 1996 (Hymenoptera: Braconidae: Ichneutinae: Ichneutini) from Europe and Oriental China are keyed, and two new species are described. The Chinese species of the only other known genus of the tribe, *Ichneutes* Nees, 1816, are keyed and three new species are described. This represents the first record of the genera *Pseudichneutes* and *Ichneutes* from the Oriental region as well as from China.

Introduction

The subfamily Ichneutinae Foerster, 1862 (Hymenoptera: Braconidae) is a relatively small subfamily of the huge family Braconidae with about 60 valid species. Currently, sixteen generic names are available for these species. Three (also biologically) distinct tribes, e.g., Ichneutini, Muesebeckiini and Proteropini, have been recognized (van Achterberg, 1993). Recently, Sharkey & Wharton (1994) have published a generic revision of this group and abandoned a tribal division, but at least the Ichneutini as treated here are a distinct monophyletic group. This revision shows several flaws (partly corrected by Sharkey (1996)), and their phylogenetic and generic analysis needs to be assessed. For example, part of the genus *Ichneutes* Nees, 1816, in their sense has no minute peg at the apex of the fore tibia (which is incorrectly considered to be an unique synapomorphy for the whole subfamily), and the interpretation and separation of the genera *Oligoneurus* Szépligeti, 1902, and *Paroligoneurus* Muesebeck, 1931, needs further research. It seems too rigorous to synonymize a genus like *Anaprixia* Mason, 1991, with its sister-genus *Paroligoneurus* Muesebeck, 1931, because the former has exodont mandibles and an highly aberrant reduction of the metasomal spiracles. It may be the consequence of too easily lumping genera together, and of (correctly) trying to avoid paraphyletic grouping.

The tribe Ichneutini Foerster, 1862, is characterized by the complete venation of the fore wing (figs 1, 21), the presence of the prepectal carina laterally (figs 4, 24), the very short pronotum (fig. 29), the lack of a pronope or subpronope; moreover the mesoscutum is truncate anteriorly (fig. 29), vein SR of hind wing is absent (without a pigmented trace; figs 1, 21), the plical lobe of the hind wing is medium-sized (figs 1, 21), the pleural and mesosternal sulci are crenulate (fig. 24), vein 1-M of fore wing is abruptly bent anteriorly (figs 11, 27), the maxillary palp consists of five segments, the first metasomal tergite and the propodeum are distinctly sculptured (figs 5, 8), and the male has its seventh metasomal tergite enlarged and depressed, bearing a pair of

tergal pits posteriorly (figs 12, 19). The described species of the tribe Ichneutini reflect a Holarctic-biased distribution. Mainly because their hosts (Tenthredinid sawflies) are much more common in the Holarctic region than elsewhere. It is also true for the remainder of the Ichneutinae, but this may result partly from that many tropical species remain undescribed (Sharkey & Wharton, 1994). The members of the Ichneutini and Proteropini are koinobiont ovo-larval endoparasites of sawfly larvae of the families Tenthredinidae and Argidae, respectively, while the members of the tribe Muesebeckiini parasitize leaf-mining lepidopteran hosts.

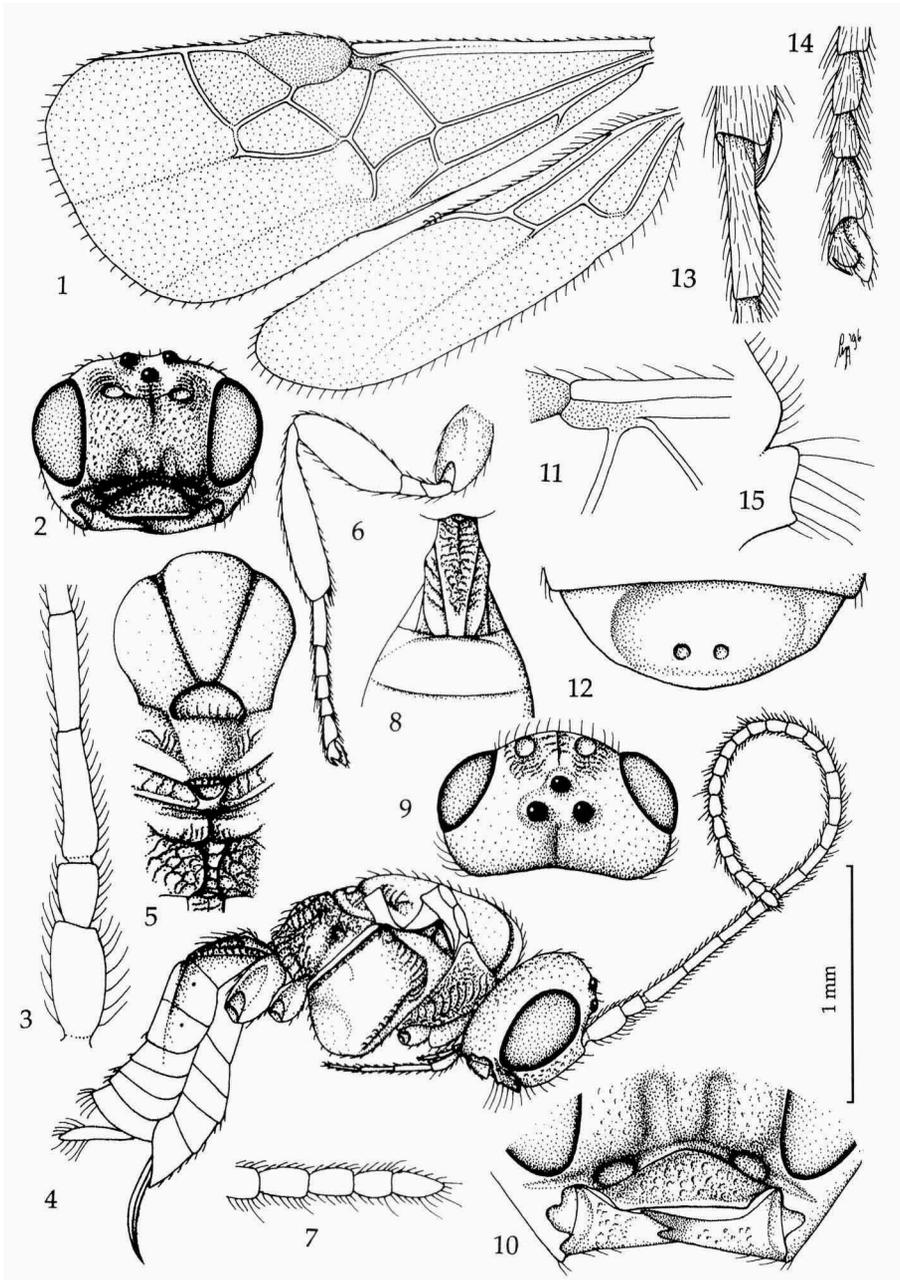
In the present paper two new species of the genus *Pseudichneutes* Belokobylskij, 1996, (one from China, and one from Bulgaria and Yugoslavia) and three new species of the genus *Ichneutes* Nees, 1816, from China are described. This represents the first record of both genera from the Oriental region as well as from China.

For the terminology used in this paper, and for the identification of the subfamily Ichneutinae and its tribes, see van Achterberg (1993).

Descriptions and keys

Key to genera of the tribe Ichneutini Foerster

1. Anterior tentorial pits strongly enlarged and deep, elliptical, and its sides angulate (figs 2, 10); epistomal suture deeply impressed medially (figs 2, 10); clypeus triangular, flattened and usually distinctly protruding basally (figs 10, 15, 20); vein 1-M of fore wing less distinctly bent anteriorly (fig. 11); vein r of fore wing issuing from middle of pterostigma (fig. 1); vein SR1 of fore wing straight or curved towards apex of wing, subvertical (fig. 1); marginal cell of fore wing narrower (vein 1-R1 0.4-0.5 times length of pterostigma), and subtruncate apically (fig. 1); veins m-cu and 2-CU1 of fore wing forming a right angle (fig. 1); vein CU1b of fore wing absent or unsclerotized (fig. 1); vein SC+R1 of hind wing curved (fig. 1); vein cu-a of hind wing reclivous or almost vertical, comparatively short (fig. 1); prepectal carina absent ventrally (fig. 4); precoxal sulcus largely smooth (fig. 4); medio-posterior pits of seventh tergite of male medium-sized and comparatively close to each other (fig. 12) *Pseudichneutes* Belokobylskij
- Anterior tentorial pits small and shallow, round or elliptical, and its sides rounded (figs 16, 22); epistomal suture shallowly impressed medially (fig. 17); clypeus transverse, convex (figs 17, 22); vein 1-M of fore wing abruptly curved and with distinct bend anteriorly (fig. 27); vein r of fore wing issuing distinctly in front of middle of pterostigma (fig. 21); vein SR1 of fore wing oblique, curved towards pterostigma, or rarely almost straight (fig. 21); marginal cell of fore wing longer (vein 1-R1 0.6-0.9 times length of pterostigma), and acute apically (fig. 21); veins m-cu and 2-CU1 of fore wing forming an acute angle (fig. 21); vein CU1b of fore wing present and distinctly sclerotized (fig. 21), but in some species variable; vein SC+R1 of hind wing slightly curved or straight (fig. 21); vein cu-a of hind wing distinctly inclivous, or subvertical, comparatively long (fig. 21); prepectal carina present ventrally (fig. 24); precoxal sulcus largely sculptured (fig. 24); medio-posterior pits of seventh tergite of male small, far removed from each other (fig. 19) *Ichneutes* Nees



Figs 1-15, *Pseudichneutes atanassovae* spec. nov., ♀, holotype, but 12 of ♂- and 13 of ♀-paratype. 1, wings; 2, head, frontal aspect; 3, base of antenna; 4, habitus, lateral aspect; 5, mesosoma, dorsal aspect; 6, hind leg; 7, apex of antenna; 8, first and second metasomal tergites, dorsal aspect; 9, head, dorsal aspect; 10, detail of clypeus and anterior tentorial pits; 11, detail of base of vein 1-M of fore wing; 12, seventh tergite, dorsal aspect; 13, detail of apex of fore tibia; 14, outer hind claw; 15, clypeus and epistomal suture, lateral aspect. 1, 4, 6: 1.0 × scale-line; 2, 5, 8, 9: 1.2 ×; 3, 7, 11, 14, 15: 2.5 ×; 10, 12: 1.9 ×; 13: 2.8 ×.

Pseudichneutes Belokobylskij, 1996
(figs 1-15, 18, 20)

Pseudichneutes Belokobylskij, 1996: 307-308. Type species (by original designation): *Ichneutes levis* Wesmael, 1835.

Diagnosis.— Antenna with 22-28 segments; maxillary palp with 5 segments; labial palp with 4 segments; occipital carina absent; vertex with medio-posterior depression (fig. 9); depression around stemmaticum smooth (fig. 9); anterior tentorial pits strongly enlarged and deep, its sides angulate (figs 2, 10); epistomal suture deeply impressed (fig. 15); clypeus triangular, flattened, and strongly raised basally, but in *P. levis* sometimes nearly flat basally (figs 15, 20); malar space comparatively narrow (fig. 10); mandible robust, not twisted, with lower tooth slightly shorter than the upper tooth, but distinctly shorter in *P. atanassovae* (fig. 10), its teeth more slender than in *Ichneutes* (fig. 10); propleuron without longitudinal carina; anterior subalar depression with one carina; prepectal carina present laterally, but absent ventrally (fig. 4); mesosternal sulcus deep and coarsely crenulate; precoxal sulcus shallowly impressed and largely smooth; scutellum rugose or with crenulate depression medio-posteriorly (fig. 5); propodeum areolate-rugose; tarsal claws with a large rounded or acute lobe (figs 14, 18); fore tibia without small apical peg (fig. 13); hind tibia robust (fig. 6); vein 1-M of fore wing weakly curved anteriorly (fig. 11); vein r of fore wing issuing from middle of pterostigma (fig. 1); vein SR1 of fore wing straight; marginal cell of fore wing small, vein 1-R1 0.4-0.5 times length of pterostigma (fig. 1), subtruncate apically; veins m-cu and 2-CU1 of fore wing forming a right angle (fig. 1); vein CU1b of fore wing absent or unsclerotized; hind wing with 3 hamuli, close together; vein 1r-m of hind wing subvertical (fig. 1); vein SC+R1 of hind wing curved; vein cu-a of hind wing reclivous or vertical, comparatively short (fig. 1); vein 1-1A of hind wing complete; first metasomal tergite with pair of dorsal carinae (carinae often weak but medial region of tergite is raised), without medio-longitudinal depression; second tergite smooth or superficially sculptured; seventh tergite of male enlarged, with medium-sized, tergal pits close to each other medio-posteriorly (fig. 12); cerci plate-like; hypopygium of female without dense patch of setae apically.

Biology.— Parasites of mining larvae of Tenthredinidae.

Distribution.— Palaearctic and Oriental: three known species. Two species are described below: one from montane Oriental China and one from montane Bulgaria and Yugoslavia.

Key to species of the genus *Pseudichneutes* Belokobylskij

1. Prothorax and head (except stemmaticum) yellowish; first metasomal tergite without dorsal carinae, except for short basal remnants (fig. 33); second tergite smooth; China (Oriental: montane) *P. flavicephalus* spec. nov.
- Prothorax, and usually head, black; first metasomal tergite with dorsal carinae (fig. 8); surface of second tergite variable 2
2. Anterior tentorial pits elongate elliptical (fig. 10); face tuberculate convex ventro-laterally (fig. 10); hind tibia dark brown or infuscate; epistomal suture very deep medially (figs 2, 10, 15); Europe (montane)
..... *P. atanassovae* van Achterberg, spec. nov.

- Anterior tentorial pits round or nearly so; face weakly convex ventro-laterally, not tuberculate; hind tibia pale brownish-yellow; epistomal suture moderately deep medially (fig. 20); Europe (lowland and submontane), Central Asia (Kazakhstan), Russian Far East (Krasnodar & Primorsk Territories) *P. levis* (Wesmael, 1835)

Pseudichneutes atanassovae van Achterberg, spec. nov.
(figs 1-15)

Material.— Holotype, ♀ (RMNH), "Bulgaria, Rila Mts.", "v. Jastreber, 23.vii.1982, leg. Zaykov". Paratypes: 1 ♀ + 1 ♂ (RMNH), "Yugoslavia, ex coll. Zaykov, RMNH Leiden, 1991", "Montenegro, Cherna gora Sz., leg. A. Germanov".

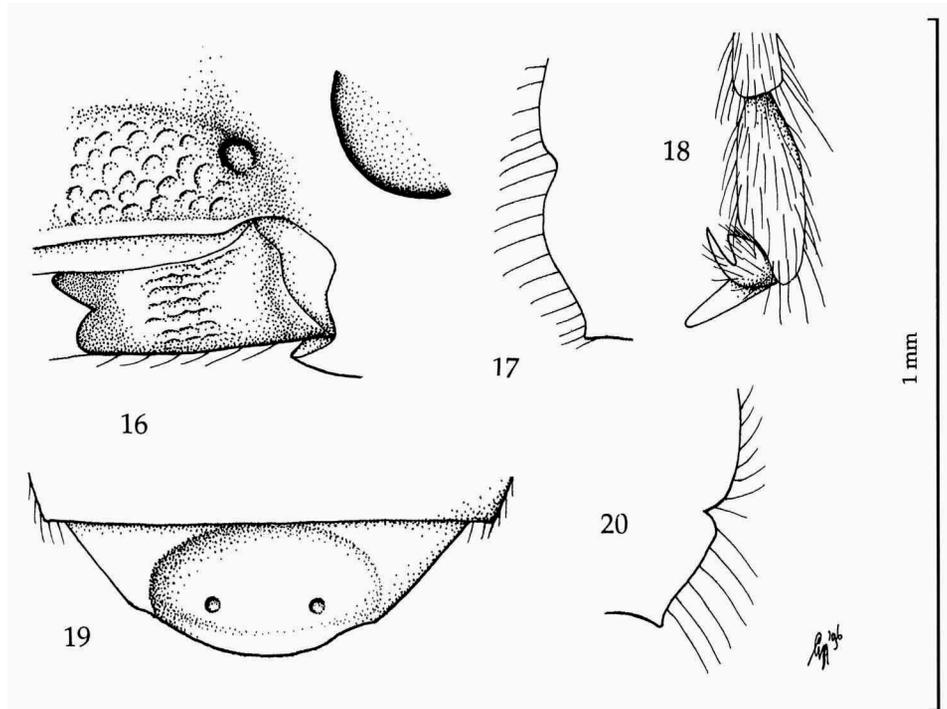
Description.— Holotype, ♀, length of body 2.4 mm, of fore wing 2.7 mm.

Head.— Width of head in dorsal view 1.8 times its length; antennal segments 27, length of scapus (= first segment) twice length of pedicellus (= second segment), length of third segment 1.2 times fourth segment, length of third, fourth and penultimate segments 4.0, 3.5 and 1.4 times their width, respectively (figs 3, 7); vertex and temple shiny, anteriorly punctulate, posteriorly distinctly punctate, with sparse long setae; vertex with a distinct depression medio-posteriorly (fig. 9); length of eye in dorsal view 1.9 times temple (fig. 9); temple roundly narrowed posteriorly (fig. 9); POL:OD:OOL = 5:5:6 (fig. 9); frons anteriorly rugulose-aciculate, posteriorly smooth; face with three distinctly convex areas ventrally (figs 2, 10), distinctly punctate, shiny, its minimum width 1.8 times its median length; anterior tentorial pits very large and deep, elliptical, close to eye (fig. 10); inter-tentorial line 1.6 times maximum diameter of pit, and about 5 times ocular-tentorial line; epistomal suture deep (fig. 15); width of clypeus about 3.5 times its length, clypeus punctate, dorsally strongly raised (figs 10, 15), and its ventral margin upcurved; length of malar space 0.3 times basal width of mandible, malar space depressed; upper tooth of mandible much longer than lower one (fig. 10); length of maxillary palp 0.9 times height of head.

Mesosoma.— Length of mesosoma 1.3 times its height; side of pronotum mainly finely rugose and distinctly crenulate medially; mesoscutum and scutellum finely sparsely punctate and setose, shiny; scutellum with distinct crenulate depression medio-posteriorly; notauli deep, anterior half finely crenulate, remainder largely smooth; prescutellar sulcus large, deep, only posteriorly weakly crenulate (fig. 5); mesopleuron largely smooth, only dorsally crenulate and with some punctures (fig. 4), and ventrally punctulate; precoxal sulcus slightly impressed posteriorly, smooth; metapleuron rugose ventrally, dorsally mainly smooth; propodeum largely rugose (except anteriorly, fig. 5), with short median carina anteriorly and narrow areola (fig. 5).

Wings.— Fore wing: length of pterostigma 2.7 times its width (fig. 1); length of 1-R1 0.45 times pterostigma; r issuing from middle of pterostigma; r:3-SR:SR1 = 2:13:19; 2-SR:3-SR:r-m = 14:13:5; cu-a postfurcal by about twice its width (fig. 1). Hind wing: M+CU:1-M:1r-m = 26:12:7; cu-a unpigmented posteriorly and curved towards wing base (fig. 1).

Legs.— Hind coxa smooth, except some punctulation; length of hind femur, tibia and basitarsus 2.6, 5.6 and 3.4 times their width, respectively (fig. 6); length of hind



Figs 16, 17, 19, *Ichneutes reunitor* Nees, ♀, Netherlands, Tongeren, but 19 of ♂, Austria, Filzmoos; figs. 18, 20, *Pseudichneutes levis* (Wesmael), ♀, Netherlands, Oostvoorne. 16, detail of mandible and anterior tentorial pit; 17, 20, clypeus and epistomal suture, lateral aspect; 18, outer hind claw; 19, seventh metasomal tergite, dorsal aspect. 16, 17, 20: 1.0 × scale-line; 18: 1.2 ×; 19: 0.8 ×.

tibia 1.1 times hind tarsus; length of hind basitarsus 1.2 times combined length of second and third segments of hind tarsus (fig. 6); lobe of tarsal claws large and apically wide and rounded (fig. 14); hind tibia petiolate basally and remainder robust (fig. 6); spurs of hind tibia both 0.4 times hind basitarsus.

Metasoma.— Length of metasoma about as long as mesosoma; length of first tergite 1.5 times its apical width; first tergite rather sparsely rugose, baso-medially flat, rugose, medially raised but flattened, dorsal carinae complete, but its posterior half weak (fig. 8); second and following tergites smooth, with a row of setae; length of second tergite 0.4 times its apical width (fig. 8); second tergite without medio-basal carina, with curved groove anteriorly and antero-lateral corners less sclerotized (fig. 8); second suture narrow and shallow, nearly straight; length of ovipositor sheath 0.1 times fore wing (figs 1, 4).

Colour.— Black; four basal segments of antenna, fore and middle legs (except coxae) yellow; remainder of palpi, fore and middle coxae, hind leg, second tergite anterio-laterally, tegulae, apex of metasoma, pterostigma, and veins dark brown; wing membrane distinctly infusate.

Variation.— Antennal segments 27 (1♀) or 28 (1♂), length of fore wing 2.7-3.1 mm, of body 2.4-3.1 mm; vein cu-a of fore wing postfurcal by 1-2 times its width; length of first metasomal tergite 1.5-1.7 times its apical width.

Note.— Named after the Bulgarian hymenopterist and close friend of the author of this species, Dr Petia Atanassova (Sofia).

Pseudichneutes flavicephalus spec. nov.
(figs 32-35)

Material.— Holotype, ♂ (ZAU), "Mt Shiming, Yuyao, Zhejiang, 28.iv.1980, He Junhua, [no.] 801223".

Description.— Holotype, ♂, length of body 3.8 mm, of fore wing 3.4 mm.

Head.— Width of head in dorsal view 1.8 times its length; antennal segments 28, length of first segment twice length of second segment, length of third segment 1.2 times fourth segment, length of third, fourth and penultimate segments 4.5, 3.8 and 2.0 times their width, respectively; vertex and temple extremely finely coriaceous, almost smooth, with sparse long setae; vertex with a shallow depression medio-posteriorly; length of eye in dorsal view 1.6 times temple; temple slightly narrowed posteriorly (fig. 35); POL:OD:OOL = 3:3:9; frons smooth; face distinctly concave submedio-longitudinally, extremely finely coriaceous, almost smooth, its width 1.5 times its length; anterior tentorial pits very large and deep, near orbit of eye (fig. 34); inter-tentorial line 1.3 times maximum diameter of pit, and 4.5 times ocular-tentorial line; clypeus triangular, its width 2.6 times its length, basally distinctly raised, and its ventral margin upcurved; malar space 0.2 times basal width of mandible.

Mesosoma.— Length of mesosoma 1.5 times its height; anterior half of side of pronotum finely granulate-punctate, smooth posteriorly, and vaguely crenulate medially; mesoscutum and scutellum finely punctate and setose, shiny; notauli deep, crenulate; prescutellar sulcus large, shallow, irregularly longitudinally rugose; mesopleuron largely smooth, only anteriorly and dorsally narrowly rugose; precoxal sulcus only shallowly impressed, smooth; metapleuron finely rugose, medially raised; propodeum largely transversely rugose, medio-basally longitudinally rugose.

Wings.— Fore wing: length of pterostigma 3.0 times its width; length of 1-R1 0.4 times length of pterostigma; r issuing from middle of pterostigma; r:3-SR:SR1 = 4:17:28; 2-SR:3-SR:r-m = 14:17:4; vein 1-M just touching vein 1-SR+M (fig. 32); vein cu-a postfurcal by its width. Hind wing: M+CU:1-M:1r-m:cu-a = 26:13:9.5:10; vein cu-a unpigmented and curved towards wing base on posterior half.

Legs.— Hind coxa smooth; length of hind femur, tibia and basitarsus 3.8, 6.2 and 4.6 times their width, respectively; length of hind tibia 1.2 times hind tarsus; length of hind basitarsus 1.2 times combined length of second and third segments of hind tarsus.

Metasoma.— Length of metasoma as long as mesosoma; length of first tergite 1.2 times its apical width; first tergite medio-posteriorly slightly raised and densely finely rugose, medio-basally concave, weakly rugose, dorsal carinae only present at basal 0.15 (fig. 33); second and following tergites smooth, setose; length of second tergite 0.5 times its apical width.

Colour.— Head and basal three segments of antenna brownish-yellow; remainder of antenna blackish; area with stemmaticum brown; apical tooth of mandible reddish-brown; mesosoma and metasoma black to blackish-brown; prothorax and mesosternum reddish-yellow anteriorly; metasternum reddish; legs reddish-yellow, hind

femur dorsally, tibia dorsally and posteriorly, and basitarsus brownish; wing membrane brownish; pterostigma and veins brown.

Ichneutes Nees, 1816
(figs 16, 17, 19, 21-31, 36-43)

Ichneutes Nees, 1816: 275; Shenefelt, 1973: 805; Tobias, 1986: 292-293 (translation: 510-511; key to Palaearctic species); Papp, 1987: 435, 444, 445 (Korea); Sharkey & Wharton, 1994: 889. Type species (by monotypy): *Ichneutes reunitor* Nees, 1816.

Ichneustes Szépligeti, 1896: 195. Typographical error.

Diagnosis.— Antenna with 23-38 segments; maxillary palp with 5 segments; labial palp with 4 segments; occipital carina absent; depression around stemmaticum sculptured (fig. 23); anterior tentorial pits small to medium-sized and comparatively shallow, round or elliptical, its sides rounded (figs 16, 22); epistomal suture shallowly impressed (figs 17, 22); malar space comparatively long (fig. 22), but comparatively short in *I. lapponicus* Thomson, 1895 (Haeselbarth, in litt.); clypeus normal (fig. 22); mandible not twisted, with lower tooth slightly shorter than the upper tooth, both robust (fig. 16); propleuron without longitudinal carina; prepectal carina complete (fig. 24); anterior subalar depression with one carina; precoxal sulcus more or less impressed and area largely sculptured (fig. 24); scutellum with crenulate depression medio-posteriorly (fig. 29); mesosternal sulcus deep and coarsely crenulate; propodeum areolate-rugose; tarsal claws with a distinct lobe (fig. 31); apex of fore tibia with minute peg; vein 1-M of fore wing with distinct bend anteriorly (fig. 27); vein r of fore wing issuing in front of middle of pterostigma (fig. 21); vein SR1 of fore wing oblique or somewhat curved towards pterostigma; marginal cell of fore wing comparatively long and acute apically (fig. 21); vein CU1b of fore wing present and sclerotized (fig. 21), but absent in some species; vein 1r-m of hind wing oblique or subvertical (fig. 21); vein SC+R1 of hind wing slightly curved; vein cu-a of hind wing present; vein 1-1A of hind wing complete; first metasomal tergite with pair of dorsal carinae (carinae often weak but the medial region of first tergite always raised) (fig. 26); seventh tergite of male with small tergal pits medio-posteriorly, far removed from each other (fig. 19); sixth and seventh tergites without large medial excavations; cerci plate-like; hypopygium of female without dense patch of setae apically.

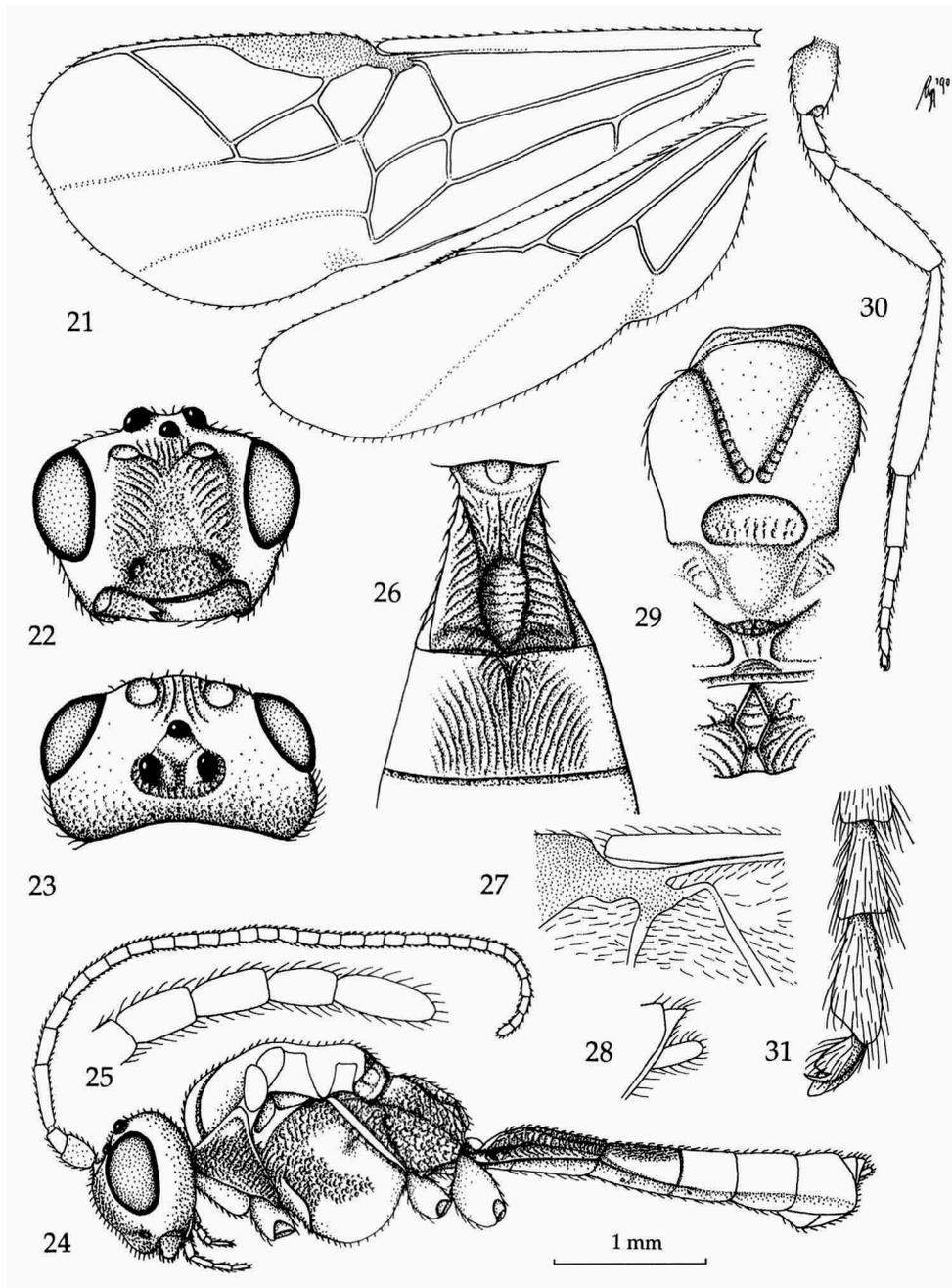
Biology.— Ovo-larval endoparasites of exposed living and of gall-forming larvae of Tenthredinidae.

Distribution.— Holarctic: 17 described species (Shenefelt, 1973; Papp, 1987; Belokobylskij, 1990; Haeselbarth, in litt.) and several undescribed species (Haeselbarth, in litt.). In this paper three new species are described from China, it is the first record of this genus from Oriental region as well as from China.

Note.— All three Chinese species have the second tergite with a short medio-basal carina and area beside it depressed (fig. 39).

Key to species of the genus *Ichneutes* Nees from China

1. Prothorax, mesoscutum and mesopleuron dorsally reddish-yellow, remainder of mesosoma black; anterior tentorial pits oval (fig. 36); legs blackish or dark brown;



Figs 21-31, *Ichneutes reunitor* Nees, ♀, Netherlands, Tongeren. 21, wings; 22, head, frontal aspect; 23, head, dorsal aspect; 24, habitus, lateral aspect; 25, apex of antenna; 26, first and second metasomal tergites, dorsal aspect; 27, detail of base of vein 1-M of fore wing; 28, ovipositor sheath, lateral aspect; 29, mesosoma, dorsal aspect; 30, hind leg; 31, outer hind claw. 21, 24, 30: 1.0 × scale-line; 22, 23, 26, 29: 1.5 ×; 27, 28: 2.2 ×; 25, 31: 5.0 ×.

- precoxal sulcus comparatively wide and shallow, only anteriorly crenulate
 *I. rufithorax* He & van Achterberg, spec. nov.
- Mesosoma entirely black; anterior tentorial pits round (figs 40, 43); legs yellowish
 or reddish; precoxal sulcus narrow and deeply impressed, completely crenulate ...
 2
2. Temple distinctly widened behind eye (fig. 42); hind femur brown; colour of
 metasoma of female unknown *I. wuyiensis* He & Chen, spec. nov.
- Temple nearly parallel-sided behind eye (fig. 41); hind femur brownish-yellow;
 metasoma of female reddish-yellow *I. orientalis* He & Chen, spec. nov.

Ichneutes orientalis He & Chen, spec. nov.
 (figs 38-41)

Material.— Holotype, ♀ (ZAU), "Zhejiang, Wencheng, 6.ix.1985, Liu Fuming, [no.] 853160". Paratype:
 1 ♂ (ZAU), same data as holotype, but no. 853186.

Description.— Holotype, ♀, length of body 4.4 mm, of fore wing 4.0 mm.

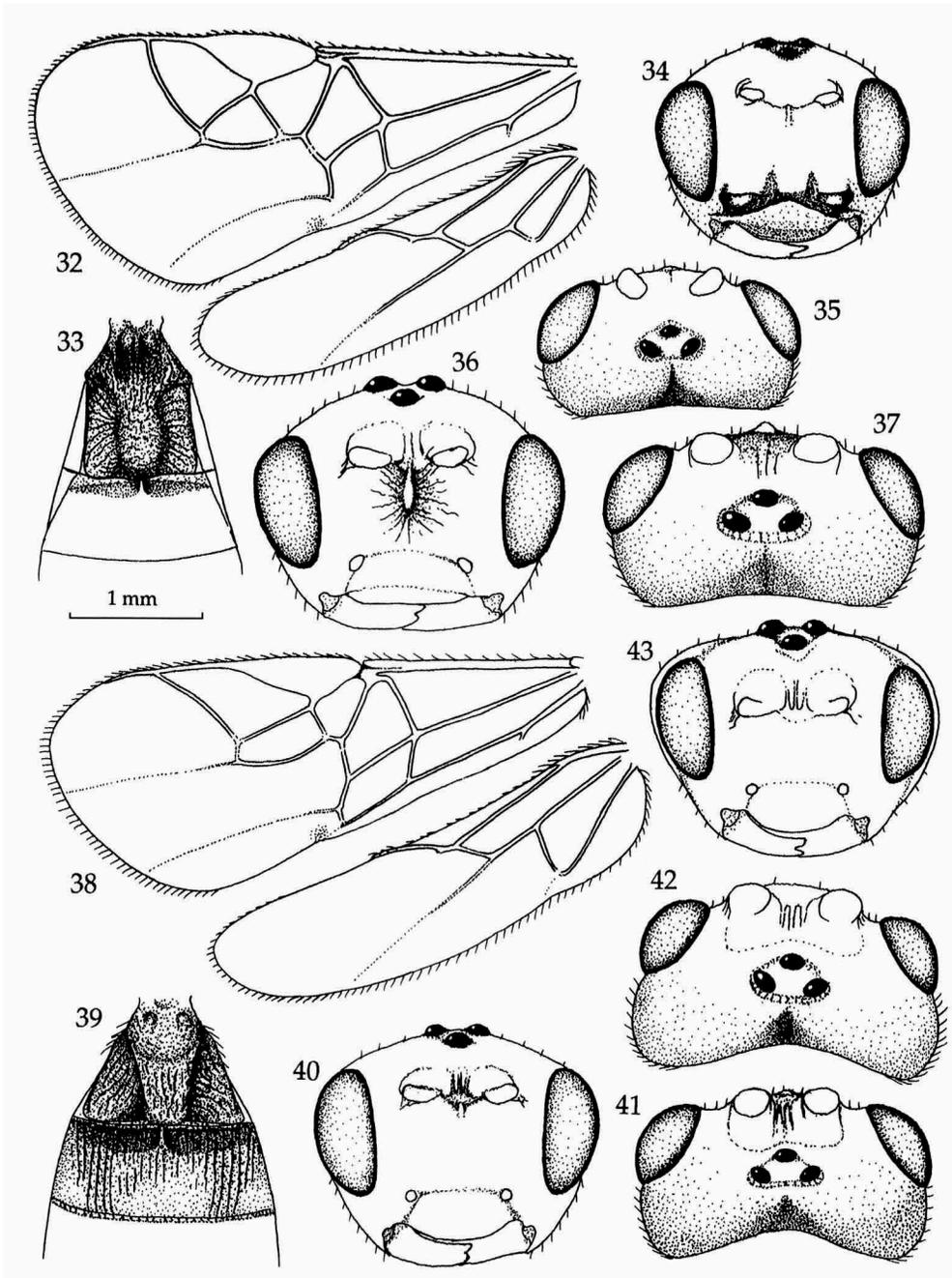
Head.— Width of head in dorsal view 2.1 times its length; antennal segments 29,
 length of first segment 2.1 times second segment, length of third segment 1.6 times
 fourth segment, length of third, fourth and penultimate segments 4.0, 2.0 and 2.0
 times their width, respectively; vertex and temple sparsely finely punctulate because
 of setosity, almost smooth; vertex with a shallow medio-longitudinal depression
 posteriorly; length of eye in dorsal view equal to temple; temple parallel-sided behind
 eye (fig. 41); POL:OD:OOL = 4:3.5:12; frons with some rugae between antennal
 sockets, rest largely smooth; face medio-longitudinally ridge-like raised, densely
 finely rugose, its width 1.7 times its length; anterior tentorial pits round and small;
 inter-tentorial line 2.4 times ocular-tentorial line; clypeus nearly smooth in apical half,
 apical margin round, its width 1.7 times its length; malar space 0.5 times basal width
 of mandible.

Mesosoma.— Length of mesosoma 1.5 times its height; side of pronotum medially
 strongly crenulate, anteriorly punctate; mesopleuron largely smooth; precoxal sulcus
 distinctly impressed and crenulate; metapleuron medially raised and finely rugose,
 peripherally crenulate; mesoscutum and scutellum finely punctate and setose, nearly
 smooth; notauli distinct, crenulate, posteriorly with a medio-longitudinal carina;
 prescutellar sulcus large and deep with 5 carinae; propodeum largely irregularly
 reticulate-rugose, basally raised but without median carina, areola and posterior area
 slightly longitudinally convex and transversely striate.

Wings.— Fore wing: length of pterostigma 2.4 times its width; length of vein 1-R1
 0.9 times length of pterostigma; vein r issuing from basal 0.42 of pterostigma; r:3-
 SR:SR1 = 3:23:30; 2-SR:3-SR:r-m = 11:23:5; vein cu-a just postfurcal (fig. 38). Hind
 wing: 1-M:1r-m:cu-a = 16:10:16; vein cu-a inclivous and curved posteriorly.

Legs.— Hind coxa smooth; length of hind femur, tibia and basitarsus 3.6, 6.0 and
 4.5 times their width, respectively; length of hind tibia 1.3 times hind tarsus; length of
 hind basitarsus 1.3 times combined length of second and third segments of hind
 tarsus.

Metasoma.— Length of metasoma as long as head and mesosoma combined;



Figs 32-35, *Pseudichneutes flavicephalus* spec. nov., ♀, holotype; figs 36, 37, *Ichneutes rufithorax* spec. nov., ♀, holotype; figs 38-41, *I. orientalis* spec. nov., ♀, holotype; figs 42, 43, *I. wuyiensis* spec. nov., ♂, holotype. 32, 38, wings; 33, 39, first and second metasomal tergites, dorsal aspect; 34, 36, 40, 43, head, frontal aspect; 35, 37, 41, 42, head, dorsal aspect. 32, 38: 1.0 × scale-line; 36, 37, 42, 43: 2.5 ×; 33-35, 39-41: 1.8 ×.

length of first tergite 0.8 times its apical width; first tergite gradually widened apically, densely finely rugose, basally (between dorsal carinae) concave, posteriorly (on its posterior half) medially raised, spiracles at basal 0.4, dorsal carinae distinct, its maximal interspace at basal 0.2, posteriorly roundly connected each other (fig. 39); second tergite finely longitudinally rugose, medio-basally with carina, its length 0.37 times its apical width (fig. 39); third to sixth tergites finely punctulate and setose; ovipositor sheath slender, 0.5 times hind basitarsus.

Colour.— Head and mesosoma black; mandibles, palpi and tegulae reddish-yellow; antenna blackish-brown; metasoma and legs reddish; wing membrane light brownish, pterostigma and veins brown.

Variation.— Male similar to female in general, but differs in metasoma largely black, only first and second tergites partly reddish.

Note.— This species is similar to *I. flaviventris* Hellen, 1958, but differs by having the metasoma distinctly longer than the mesosoma, and the clypeus and antenna entirely blackish-brown. Also similar to *I. reunitor* Nees, but it can be separated from the latter by having the metasoma of female reddish-yellow, the anterior tentorial pits round and small, metasoma of female completely reddish, frons largely smooth, length of first tergite 0.8 times its apical width, legs entirely reddish, and second tergite basally with a short carina.

Ichneutes rufithorax He & van Achterberg, spec. nov.
(figs 36, 37)

Material.— Holotype, ♂ (ZAU), "Zhejiang, Hangzhou, 1.v.1980, Yu Peiyu, [no.] 801240". Paratypes: 2 ♀ ♀ (ZAU, RMNH), "Hunan, 19[86], Wang Wenxue, [no.] 870141 [and 870142]".

Description.— Holotype, ♂, length of body 5.2 mm, of fore wing 4.7 mm.

Head.— Width of head 1.7 times its length; antennal segments 26(+), length of first segment 2.4 times second segment, length of third segment 1.7 times fourth segment, length of third and fourth segments 3.5 and 1.7 times their width, respectively; vertex and temple densely finely punctate-reticulate; length of eye in dorsal view 1.3 times temple; temple gradually narrowed behind eye (fig. 37); POL:OD:OOL = 4:6:12; frons shortly crenulate; face densely finely rugose, medio-longitudinally roof-like raised, dorsally with a protuberance, its width 1.8 times its length; anterior tentorial pits medium-sized and oval; inter-tentorial line 3.0 times ocular-tentorial line; clypeus coarsely punctate, basally slightly transversely raised, apical margin truncate, its width 2.2 times its length; malar space 0.3 times basal width of mandible.

Mesosoma.— Length of mesosoma 1.4 times its height; side of pronotum anteriorly and posteriorly crenulate, remainder smooth; mesopleuron largely smooth, dorsally crenulate; precoxal sulcus weakly impressed, anteriorly weakly rugose; metapleuron medially raised and finely rugose, peripherally crenulate; mesoscutum and scutellum finely punctate and setose, nearly smooth; notauli distinct, superficially crenulate; prescutellar sulcus large and deep with indistinct carinae; propodeum largely irregularly coarsely reticulate-rugose, basally slightly raised and with a median carina, areola and posterior area more or less distinct, anteriorly

transversely striate.

Wings.— Fore wing: length of pterostigma 2.4 times its width; length of vein 1-R1 0.6 times length of pterostigma; vein r issuing from basal 0.35 of pterostigma; r:3-SR:SR1 = 4:22:31; 2-SR:3-SR:r-m = 16:22:6 vein cu-a just postfurcal. Hind wing: 1-M:1r-m:cu-a = 15.5:13:16; vein cu-a inclivous and slightly curved posteriorly.

Legs.— Hind coxa smooth; length of hind femur, tibia and basitarsus 3.6, 5.6 and 3.7 times their width, respectively; length of hind tibia 1.4 times hind tarsus; length of hind basitarsus 1.1 times combined length of second and third segments of hind tarsus.

Metasoma.— Length of metasoma longer than mesosoma, but shorter than head and mesosoma combined; length of first tergite 0.75 times its apical width; first tergite straight laterally, gradually widened apically, densely finely rugose, basally (between dorsal carinae) slanted towards base, spiracles at basal 0.4 and slightly protruding, dorsal carinae distinct, basally parallel, posteriorly convergent and connected to each other; second tergite medially finely rugose, its length 0.5 times its apical width, medio-basally with short carina; third to sixth tergites setose, without distinct punctuation; apical tergite glabrous, apical margin obtusely round; ovipositor sheath slightly flat, 1.5 times hind basitarsus.

Colour.— Head and metasoma black; mandibles except teeth reddish-yellow, palpi yellowish-brown; first and second sternites light brown, basally and posteriorly more or less white; prothorax, mesoscutum, base of fore wing and mesopleuron dorsally reddish; scutellum, mesopleuron ventrally, mesosternum, metathorax entirely and propodeum black; legs black; wing membrane brownish; pterostigma and veins brown.

Variation.— Male similar to female in general, but differs by having 33 antennal segments, the temple hardly narrowed behind eye, the prescutellar suture with 4 carinae, the areola of propodeum indistinct, the scutellum reddish anteriorly, and the length of second metasomal tergite 0.36-0.42 times its apical width.

Ichneutes wuyiensis He & Chen, spec. nov.
(figs 42, 43)

Material.— Holotype, ♂ (ZAU), "Fujian, Mt Wuyi, 16.vii.1994, Xu Zaifu, [no.] 942974".

Description.— Holotype, ♂, length of body 4.7 mm, of fore wing 3.8 mm.

Head.— Width of head in dorsal view 2.2 times its length; antennal segments 29, length of first segment 2.2 times second segment, length of third segment 1.6 times fourth segment, length of third, fourth and penultimate segments 4.2, 2.6 and 1.7 times their width, respectively; vertex and temple sparsely punctate by setosity; vertex with a shallow medio-longitudinal depression posteriorly; length of eye in dorsal view 0.9 times temple; temple swollen behind eye (fig. 42); POL:OD:OOL = 4:4:11; frons with five carinae between antennal sockets; face medio-longitudinally ridge-like raised, densely punctate-reticulate, its width 2.1 times its length; anterior tentorial pits small and round; inter-tentorial line 2.0 times ocular-tentorial line; clypeus nearly smooth in its basal half, apical margin round, its width 2.0 times its length; malar space 0.7 times basal width of mandible.

Mesosoma.— Length of mesosoma 1.4 times its height; side of pronotum medially strongly crenulate; mesopleuron largely smooth, dorsally rugose; precoxal sulcus distinctly impressed and crenulate; metapleuron medially raised and reticulate, peripherally crenulate; mesoscutum and scutellum nearly smooth; notauli distinct, crenulate, posteriorly with a medio-longitudinal carina; prescutellar sulcus large and deep, with 5 carinae; propodeum largely irregularly reticulate-rugose, basally raised, areola (irregular) and posterior area slightly longitudinally convex and transversely striate.

Wings.— Fore wing: length of pterostigma 3.7 times its width; length of vein 1-R1 0.7 times length of pterostigma; vein r issuing from basal 0.4 of pterostigma; r:3-SR:SR1 = 2.5:25:28; 2-SR:3-SR:r-m = 11:25:4; vein cu-a just postfurcal. Hind wing: 1-M:1r-m:cu-a = 17.5:11:15.5; vein cu-a inclivous and curved posteriorly.

Legs.— Hind coxa smooth; length of hind femur, tibia and basitarsus 3.2, 5.5 and 5.1 times their width, respectively; length of hind tibia 1.1 times hind tarsus; length of hind basitarsus 1.3 times combined length of second and third segments of hind tarsus.

Metasoma.— Length of metasoma as long as head and mesosoma combined; length of first tergite 0.6 times its apical width; first tergite gradually widened apically, densely reticulate-rugose, basally (between dorsal carinae) slanted towards base and smooth, posterior half raised medially, spiracles at basal 0.4 of tergite, dorsal carinae distinct, maximal distance between carinae at basal 0.2 of tergite, posteriorly becoming weak and merging into rugae; second tergite longitudinally reticulate-rugose with a strong median rugae, its length 0.3 times its apical width; third to sixth tergites sparsely finely punctulate and setose.

Colour.— Black; mandibles and palpi yellowish-brown; antenna, mesopleuron and metasomal sternites blackish-brown; legs reddish, but hind femur and tarsus infusate; wing membrane dark brown; pterostigma and veins blackish-brown.

Note.— This species is similar to *I. reunitor* Nees and *I. aborigen* Belokobylskij, 1990, but it can be separated by having the head less transverse (in other species length of the eye in dorsal view somewhat longer than temple (fig. 23), POL about equal to OD (distinctly longer in both species; fig. 23), the temple swollen behind its eyes (fig. 42), the legs entirely reddish- or yellowish-brown and the wing membrane dark brown.

Acknowledgements and abbreviations

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