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# A Taxonomic Revision of European Species of *Dinotiscus Ghesquiere* (Hymenoptera: Pteromalidae)

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**Abstract:** The european species of *Dinotiscus* Ghesquiere are reviewed and descriptions are given for four undescribed species including *Dinotiscus tirolensis, D. isvicrensis, D. zirbecus, D. avrupanensis* and *D. calcaratus* (Thomson) is elevated as a distinct species and taken off from the synonym list of *D. colon* (L.). Some new diagnostic characters for *D. eupterus* (Walker), *D. calcaratus D. aponius* (Walker) are given. Some characters of the species are discussed and illustrated. Identification keys for females and males of the species from Europe are added.

**Key words:** Pteromalidae, *Dinotiscus*, taxonomy, Europe

## INTRODUCTION

The genus *Dinotiscus* was designated as a new name for *Dinotus* Förster by Ghesquiere (1946). Ferriere (1948) and Hedqvist (1963) gave some diagnostic characters of three species of *Dinotiscus* (*aponius, eupterus, calcaratus*). Peck et al. (1964) gave its diagnostic charachters, and stated that the genus has three species from Czechoslovakia, parasitizing scolytids on *Pinus* spp. Boucek (1967) described *D. wichmanni* from Austria as a parasite of *Hylastinus obscurus* Marsh. (Coleoptera, Scolytidae). Graham (1969) gave very good detailed knowledges on the genus and created a key to four european species of the genus. Distributions of the Palearctic species were given by several authors (Herting1973; Pettersen 1976; Dzhanokmen 1978; Hansson 1991; Askew 1992). Burks (1979) listed 6 Nearctic species in the catalog of Hymenoptera of America, north of Mexico. Grissell (1983) revised the genus with all of the known species, provided some good diagnostic characters and gave an identification key for 6 species, 2 Palearctic (*colon, wichmanni*), 2 Nearctic (*thomsoni, dentroctoni*) and 2 Holarctic (*aponius, eupterus*). Yang (1987; 1996) and Liao and Huang (1988) described 4 new species from China (*armandi, bivalvis, piceae, ginlingensis*). Boucek and Rasplus (1991) and Boucek and Heydon (1997) gave the diagnostic characters of the genus in their identification keys for the genera of Pteromalidae, and stated the genus has 4 species in Europe and 4 spp. in Nearctic. Grissell (1983) defined *Dinotiscus* as follows: clypeus variable, either deeply emarginated (with 2 well-defined lobes), with a slight imagination, or straight; venter of torulus usually 1x, and rarely 2x, own diameter above line connecting ventral margins of eyes; thorax not similarly reticulate throughout, postalar plate vertically carinate; epimeron usually smooth above, propodeum nearly shiny or aluteceous medially; much merely a parallel sided rim, rarely intersected medially by a carina; supracoxal flange joined to the nucha; forewing with or without maculation; postmarginal and marginal veins longer than stigmal, postmarginal longer than marginal, stigma may be enlarged. The present work deals with a study on the materials deposited in the Zoologische Staatssammlung München (ZSM). By the study 4 new species were described and their diagnostic characters were illustrated. The new characters of other old European species and their distributions were discussed. Identification keys for the species were provided. The morphological terminology adopted herein follows mainly Graham (1969). The types are deposited in Zoologische Staatssammlung München (ZSM), Münich, Germany. The illustrations were made by the aid of camera lucida adopted on a stereoscopic microscope.

***Key to females of the species of Dinotiscus in Europe:***

1 Lower margin of clypeus with two teeth .....2
- Lower margin of clypeus subtruncate .....3
2 Upper part of mesepimeron sculptured; hindwings having basal part of costal cell with some hairs; stigma

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of forewings higher than width ..... *calcaratus* (Thomson)

- Upper part of mesepimeron smooth or reticulated only medially; hindwings having basal part of costal cell bare; stigma of forewings longer than width .....*aponius* (Walker)

3 Stigma of forewings wider than length of stigmal vein from marginal vein to top of stigma (Boucek 1967) …….....……..... *wichmanni* Boucek

- Stigma of forewings narrower than length of stigmal vein from marginal vein to top of stigma .....4

4 Antennae (Fig. 1) with 6th funicular segment 1.5x as long as broad, and with two rows of linear sensillae; club shorter than 2 preceding segments together; lower side of forewing (Fig.2) having basal cell bare; propodeum with callus having 20-25 hairs .....…… …….....*eupterus* (Walker)

- Antennae (Figs. 4, 7, 10, 14) with 6th funicular segment quadrate to slightly longer than broad, with usually one row of linear sensillae; club longer than or equal to 2 preceding segments together; lower side of forewing (Figs. 5, 8) having basal cell with some minute hairs; propodeum with callus having at most 10-15 hairs .....5

5 Head dorsally more than twice as broad as long (2.11-2.16x); eye at least 1.26x longer than width.....6

- Head dorsally less than twice as broad as long (at most 1.96x); eye at most 1.18x longer than width.....7

6 Space between eyes 0.88-0.91x the distance between notauli at front margin; pedicellus plus flagellum 1.30x as long as broad of head; cubital vein on lower side of forewing only two hairs basally (Fig. 15); hind wing on lower side with three rows of dense long hairs (Fig. 16); gaster 1.50x as long as head plus thorax (excl. Propodeum); last tergit as long as total length of first three segments of hind tarsus.....*tirolensis* sp. n.

- Space between eyes equal to 1.09 x the distance between notauli at front margin; pedicellus plus flagellum 1.15x as long as broad of head; cubital vein on lower side of forewing only two hairs basally (Fig. 5); hind wing on lower side with two rows of sparse long hairs (Fig. 6); gaster 1.26x as long as head plus thorax (excl. Propodeum); last tergit as long as total length of first four segments of hind tarsus.....*zirbecus* sp. n.

7 Total length of first three funicular segments equal to eye length (Fig. 7); club equal to two preceding segments together; breadth of oral fossa at most 1.6x malar space; pedicellus plus flagellum 1.35x longer than broad of head; forewing (Fig. 8) with postmarginal vein 1.45x as long as marginal vein, on lower side cubital and subcubital veins with long hairs; hind wing (Fig. 9) with four rows of long hairs two of which starting from level of the middle of marginal vein. 2.6-3.3 mm.....*isvicrensis.* sp. n.

- Total length of first three funicular segments 0.83x length eye (Fig. 10); club 1.25x two preceding segments together; breadth of oral fossa at least 1,7x malar space; pedicellus plus flagellum 1.29x longer than broad of head; Forewing (Fig. 11,12) with postmarginal vein 1.2x as long as marginal vein, on lower side cubital vein with long hairs; subcubital vein bare; hind wing (Fig. 13) with one and half rows of long hairs, second one of which starting from level of the middle of marginal vein. 1.9-2.2 mm…….. .....*avrupanensis* sp. n.

***Key to Males of the Species of Dinotiscus in Europe:***

1 Lower margin of clypeus with two teeth.....2

- Lower margin of clypeus subtruncate.....……..3

2 Upper part of mesepimeron sculptured; hindwings having basal part of costal cell with some hairs; stigma of forewings higher than width; mouth opening at most 1.91x the malar space; scape 1.80-1.87x as long as distance between upper margin of toruli and lower margin of median ocellus ..... *calcaratus* (Thomson)

- Upper part of mesepimeron smooth or reticulated only in some part; hind wings having basal part of costal cell bare; stigma of forewings longer than width; mouth opening at least 2.14x the malar space; scape 1.7x as long as distance between upper margin of toruli and lower margin of median ocellus .....*aponius* (Walker)

3 Stigma of forewings wider than length of stigmal vein from marginal vein to top of stigma (Boucek 1967) ……..... *wichmanni* Boucek

- Stigma of forewings narrower than length of stigmal vein from marginal vein to top of stigma .....4

4 Breadth of oral fossa 2.06-2.11x malar space; upper part of mesepimeron smooth; hind wings having submarginal vein 9-10 hairs basally, on lower side with 4 complete rows of hairs along marginal vein.....*eupterus* (Walker)
- Breadth of oral fossa 1.87x malar space; upper part of mesepimeron weakly reticulated; hind wings having submarginal vein at most 6 hairs basally, on lower side with at most 2 complete rows of hairs along marginal vein.....5
5 Hind wings on lowerside below marginal vein with two row of dense hairs and the second row beginning about 1/5 of marginal vein; submarginal vein 6 hairs basally; scape 1.39-1.53x as long as distance between upper margin of toruli and lower margin of median ocellus. 2.5 mm.....*isvicrensis* sp. n.
- Hind wings on lower side below marginal vein with one row of sparce hairs and the second row beginning about 2/3 of marginal vein; submarginal vein at most 4 hairs basally; scape 1.23-1.27x as long as distance between upper margin of toruli and lower margin of median ocellus. 1.5 mm.....*avrupanensis* sp. n.

***Dinotiscus calcaratus* (Thomson) stat. nov.**

*Dinotus calcaratus* Thomson, 1878: 40, f#.
*Dinotiscus calcaratus* (Thomson) Ferriere 1948: 525, 526, f# m#.
*Dinotiscus calcaratus* (Thomson), Hedqvist 1963:84, 87-90, f# m#.

***Material Examined***
2 m#., 2 f#, Germany: Hessen, Lorsch, August 1962?, E. Schimitschek (ZSM).

***Comments:***
This species was recorded from Great Britain, Finland, Poland (Herting 1973), Sweden (Hansson 1991), Norway (Herting 1973; Hansson 1991), The specimens were reared together by Dr. E. Schimitschek and identified by Dr. Boucek in 1964. All of them are staying under the name of *D. calcaratus* (Thomson). All of the specimens share the characters given in the keys such as: upper part of mesepimeron completely reticulated like other parts, and basal part of costal cell of hind wings with some distinct hairs. The reticulated epimeron was given by Grissell (1983) as diagnostic character of *D. dentroctoni* (Ashmead), and by that work 4 specimens of *D. colon* from Europe were studied and it stated that in *D. dentroctoni* the upper and lower epimeron are similarly sculptured (but in other species upper epimeron polished). This statement seems that it is not applicable to the specimens identified as *D. calcaratus* in ZSM. If the specimens of *colon* were studied from Europe has epimeron smooth in upper part, *D. calcaratus* should be moved from synonym list of *colon* given by Graham (1969) as a distinct species (stat. nov.) in having the upper epimeron distinctly sculptured, and by the following characters obtained in this work: mouth opening in female about 1.64-1.68x, in male 1.82- 1.91x the malar space; scape in female 1.90-2.0x, in male 1.80-1.87x as long as the distance between upper margin of toruli and lower margin of median ocellus; distance between eyes 0.91-1.11x the distance between notauli in front margin in both sexes.

***Dinotiscus apionis (Walker):***
Synonyms were listed by Graham (1969) and Grissell (1983).

***Material Examined:***
Germany: 7 m#, 2 f#, Oberbayern, Hebertshausen, 6.viii. 1959, ex: *Fraxin*. Sp. *Fraxini*, H. Wichmann, 11 m#, 14 f#, 30.viii. 1959, same data as the former; 3 f#, München, no more data (as *Acrocormus multicolor* Rtz.), (ZSM).

***Comments:***
This species was recorded from China (Yang 1996), Russia (Dzhanokmen 1978), Sweden (Hansson 1991), Great Britain (Askew 1992), Central Europe (Garaham 1969), Japan (Kamijo 1981). The most of the specimens were reared by Dr. H. Wichmann, and by this work the following characters as additional ones given in the keys are: distance between eyes 0.85-1.0 of the distance between notauli in front margin in both sexes; mouth opening in females about 1.86-2.0x, and in males 2.14-2.29 x the malar space; upper part of mesepimeron in female mostly smooth but some of the specimens having median part reticulated, in male sculptured on basal corner in some portions; scape in female 1.36- 1.57x, in male 1.7x as long as the distance between upper

margin of toruli and lower margin of median ocellus.

***Dinotiscus Eupterus (Walker):***
(Figs. 1-3)
Synonyms were listed by Graham (1969) and Grissell (1983).

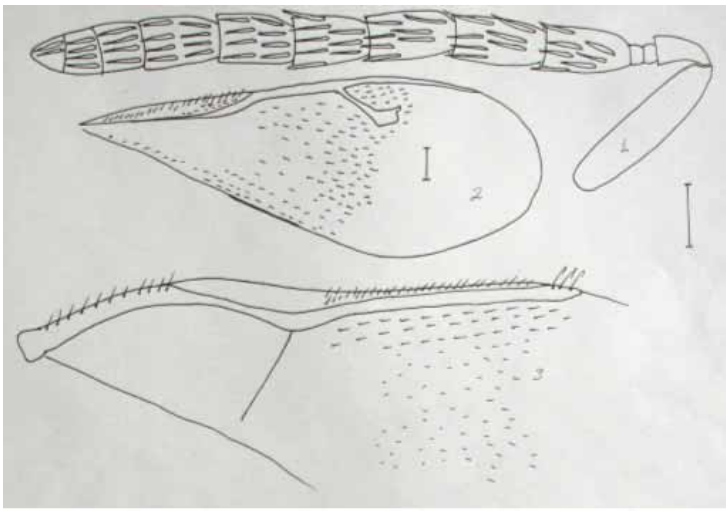


**Fig. 1-3:** *Dinotiscus eupterus* (Walker), f#. 1. antenna, 2,.3. lower side of wings, 2. forewing, 3. hind wing. Scales state for forewing 0.2 mm, and for the others 0.1 mm.

***Material Examined:***

Germany: 1 f#, Ober Bayern, FFB, Schöngeising, 550 m, 17.viii. 1991, u. Brünst, W. Schacht; 1 m#, 18.viii. 1962, ex: *Cryphalus abietis,* E. Schimitschek, (as *D. capitatus* Förster, det. Boucek 1962); 1 m#, Salzburg- Parsch, 16.v. 1963, am Waldrand, P.P. Babiy; 1 f#, 17.ix. 1963, same data as the former; Bohemia: 1 f#, Hradec Kral., October, 1945, ex: Ipidae in Piceae, Boucek, (as *D. capitatus* Förster, det. Boucek 1962); Polonia: 1 f#, Siliesia, 8.vi. 1959, ex: *Polygraphus polygraphus* L. in *Picea exelsa* Lk., A. Wrobel, 1 m#, Miechowice, Gliwice, 6.vi. 1959, ex: *Polygraphus polygraphus* L. in *Picea exelsa* Lk., A. Wrobel, (ZSM)

***Comments:***

This species was recorded from Great Britain (Garaham 1969, Askew 1992), Sweden, Germany, Central Europe (Garaham 1969), Norway (Pettersen 1976), Japan (Kamijo 1981), China (Yang 1996), Belarus, Kazakistan, Lituania, Ukraine, Russia (Dzhanokmen 1978), some parts of Canada and USA (Grissell 1983). The following characters, beside the ones mentioned in the keys, obtained by this work are: distance between eyes 0.92-1.07 x the distance between notauli in front margin in both sexes; mouth opening in females about 0.92-1.07x, and in males 1.07x the malar space; antennae (Fig. 1) with funicular segments with two rows of linear sensillae, club shorter than two preceding segments together; forewing (Fig.2) with basal vein and basal cell bare on lower side; hind wings (Fig. 3) having basal part of submarginal vein with 11 hairs, costal cell basally bare, its apical with two row of hairs, on the lower side below marginal vein with three rows of long hairs, in basal half with only micro hairs; having upper part of mesepimeron in female and male smooth; scape in female 1.40- 1.58 x, in male 1.38-1.54x as long as the distance between upper margin of toruli and lower margin of median ocellus.

***Dinotiscus zirbecus* sp. n.**
(Figs. 4-6)

***Types Holotype:***

f#, Switzerland, Engadin, Pontresina, (30.viii. 1964), 16.x. 1964, H. Wichmann, ex: *Pinus strobus* (=Zirbe) Ipiden befallen (ZSM).
Paratype: 1 f#, same data as holotype, except 15.v. 1965.

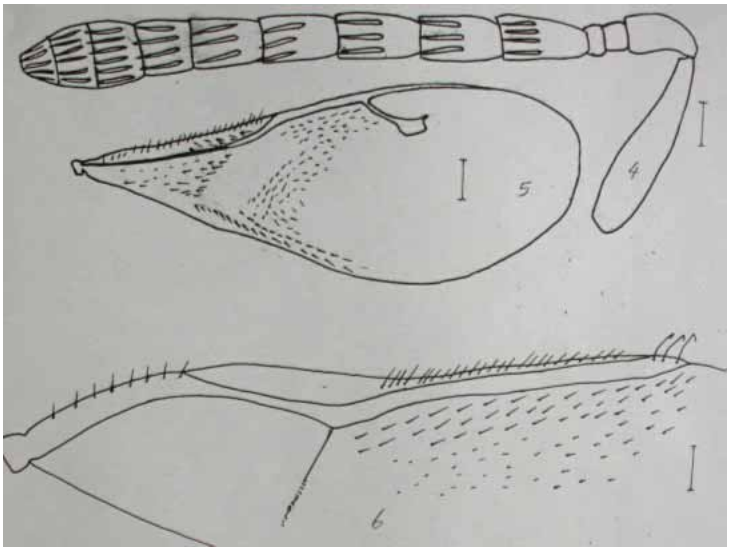


**Fig. 4-6:** *Dinotiscus zirbecus* spec. nov. f#. 4 antenna, 5,.6. lower side of wings, 5. forewing, 6. hind wing. Scales state for forewing 0.2 mm, and for the others 0.1 mm.

***Description:***

***Female:***

Lenght: 3. 5 mm. Body bluish-green; gaster black with metallic blue tint; antennae testaceous, scape and pedicellus dorsally black with metallic reflection; coxae concolorous with thorax; trochanters yellow; femora black with a weak bluish tinge, their tips testaceous; tibiae with 1/3 basal part testaceous, apical 2/3 brown; tarsi yellow, with fifth segments fuscous. Tegulae yellow. Wings hyaline, venation mainly yellow, except submarginal vein and stigma testaceous.

Head in dorsal view about 2.11x as broad as long; temples about 0.27x as long as eyes; POL 1.50 OOL; head in frontal view 1.30 x as broad as height, and 1.16x as broad as width of thorax in front of tegulae; distance between eyes 1.09x to the distance between notauli in front margin; eyes about 1.26x as long as broad, separated by 1.41x their own length. Malar space 0.67x length of an eye. Breadth of oral fossa 1.48-1.51x malar space. Head finely reticulated all over. Antennae (Fig. 4): lower edge of toruli level distinctly above the level of lower edge of eyes; scape almost as long as eye, and 1.18-1.29x as long as the distance between upper margin of toruli and lower margin of median ocellus, reaching above level of vertex; combined length of pedicellus and flagellum 1.15x breadth of head; pedicellus twice as long as broad, slightly shorter than length of first funicular segment; funicular segments longer than broad, 1st about 1.86x as long as broad, 3-5 gradually shortening, $4^{th}$ and $5^{th}$ 1.38x longer than broad and $6^{th}$ slightly transverse (7:8); total length of 1-3 funicular segments 0.91x as long as length of eye; club slightly broader than funiculars, pointed apically, 1.66x as long as broad, slightly shorter than two preceding segments together.

Thorax (exl. propodeum) about 1.44x as long as broad. Pronotal collar with distinct carina in whole margin, narrower medially; mesoscutum reticulate, notauli superficial to mid of sclerite; upper part of mesepimeron weakly reticulated or smooth. Scutellum longer than width (45: 39), frenal groove indicated laterally. Propodeum about 0.20x as long as scutellum; median area wholly reticulate; median carina absent; plicae indicated by deep foveae, reaching forward to fore margin. Fore wing (Fig. 5) with marginal vein 1.39x as long as stigmal vein; post marginal vein 1.34x as long as marginal and 1.86x stigmal vein; stigma longer than wide, lower margin straight, without fumation; on the lower side of forewing with basal vein bare, basal cell with 2 long hairs on basal part of cubital vein and some small hairs; basal cell closed, and speculum broad, semi-open below, subcubital vein with one row of hairs, below parastigma bare; disc of wing densely pilose. Hind wings (Fig. 6) with basal vein reaching mid of the wing; basal part of submarginal vein with 8 hairs; costal cell on basal half bare and distal half with a coplete row of hairs; disc on lower side below marginal vein with sparse, 3 rows of hairs, $3^{rd}$ row started from 1/5 of marginal vein, other part of disc with minute hairs having some long hairs in distal half.

Gastral petiole distinctly broader than long (5.2x), smooth. Gaster about 1.26x as long as head plus thorax (exl. propodeum), acute apically; hind margin of basal tergite (third abdominal) slightly incised medially; last

tergite almost as long as first four segments of hind tarsus (40: 42); ovipositor sheaths projecting slightly.
Male: unknown
Host. The specimens were reared from *Pinus strobus* infected by Ipidae

***Etymology:***

The species refers to the German name of the plant from which the specimens were reared

***Diagnosis:***

The new species closely resembles *tirolensis* in having many characters stated in the key but it differs from *tirolensis* in having pedicellus plus flagellum 1.15x as long as broad of head; (in *tirolensis* pedicellus plus flagellum 1.30x as long as broad of head;) and some more characters stated in the key.

***Dinotiscus isvicrensis* sp. n.**

***Types Holotype:***

f#, Germany, Oberammergau, Ammergebirge, Ammerwald, 1100m, 8-15.vi. 1968, aste gefallen Fichte, H. Wichmann, (ZSM).

Paratypes: 1 f#, Switzerland, Engadin, Pontresina, 25.v.1965, reared from the branches of *Pinus strobus* (=Zirbe) infected by *Pityog. alpinus,* taken on 30.viii. 1964, 1 f#, same as the former except 8.vi. 1965; 1 f#, same data as the former, except 15.v. 1965; 1 m#, same data as the former, except 23.v. 1965; 1 m#, same data as the former, except 11.vi. 1965; 1 f# F$^{t}$. St. Antoine, 950 m, 25.vi. 1968, ex: *P. laricia*, umgestürzt beim Antich; (all of the paratypes were reared by Dr. H.Wichmann) (ZSM).

***Description:***

***Female***

Length: 2.6-3.3 mm. Color same as *zirbecus.*

Head in dorsal view about 1.88 x as broad as long; temples about 0.25 x as long as eyes; POL 1.75 OOL; head in frontal view 1.25 x as broad as height, and 1.16 x as broad as width of thorax in front of tegulae; distance between eyes 0.73-1.12x the distance between notauli in front margin; eyes about 1.18 as long as broad, separated by 1.5x their own length. Malar space 0.69x length of an eye. Breadth of oral fossa 1.53-1.60x malar space. Head finely reticulated all over. Antennae (Fig. 7): lower edge of toruli level distinctly above the level of lower edge of eyes; scape as long as eye, and 1.25-1.30 x as long as the distance between upper margin of toruli and lower margin of median ocellus, reaching above level of vertex; combined length of pedicellus and flagellum 1.35 x breadth of head; pedicellus 2.25 x as long as broad, equal to length of first funicular segment; funicular segments longer than broad, 1-4 equal in size, 1.80 x as long as broad, 5$^{th}$ and 6$^{th}$ slightly shorter, 5$^{th}$ 1.60 x, 6$^{th}$ 1.4 x longer than broad; total length of 1-3 funicular segments as long as length of eye; club as broad as funiculars, its apical bluntly pointed, 3.10x as long as broad, as long as two preceding segments together.

Thorax (exl. propodeum) about 1.51x as long as broad. Pronotal collar with distinct carina in whole margin, narrower medially; mesoscutum reticulated, notauli superficial to mid of sclerite; upper part of mesepimeron mostly in common reticulated but in some specimens smooth. Scutellum slightly wider than long (30: 32), frenal groove indicated laterally. Propodeum about 0.23x as long as scutellum; median area wholly reticulate; median carina absent; plicae indicated by distinct carina in hind half and as foveae reaching forward to fore margin. Fore wing (Fig. 8) with marginal vein 1.40x as long as stigmal vein; post marginal vein 1.45x as long as marginal vein and 2.06x stigmal vein; stigma almost quadrangular, without fumation; lower side of wing with basal vein bare, basal cell with 5 long hairs on basal part of cubital vein and 9 small hairs; basal cell open; speculum semi-open below, subcubital vein with two rows of long hairs, below parastigma with two rows of hairs; disc of wing densely pilose. Hind wings (Fig. 9) with basal vein long; basal part of submarginal vein with 6 hairs; costal cell in basal half bare distal half with a complete row of hairs; disc on lower side below marginal vein with sparse, four rows of hairs, 1$^{st}$ and 3$^{rd}$ row started from the middle of marginal vein, 2$^{nd}$ and 4$^{th}$ rows started from the basal of marginal vein, other part of disc with minute hairs having some long sparse hairs in distal half.

Gastral petiole distinctly broader than long, smooth (3.4x). Gaster about 1.35x as long as head plus thorax (exl. propodeum), acute apically; hind margin of basal tergite (third abdominal) slightly incised medially; last tergite as long as total length of 1-2 and half of 3$^{rd}$ segments of hind tarsus; ovipositor sheaths projecting slightly.

Male: Length 2.3-2.4 mm. Similar to female except as follows: gaster brown with yellow subbasal spot; head 1.96x as broad as long; eye 1.23x as long as broad; scape as long as 1.53x as long as the distance

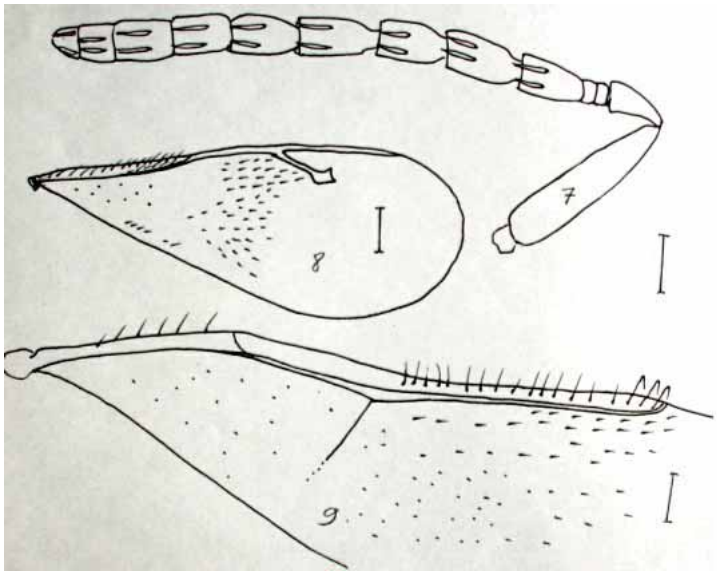


**Fig. 7-9:** *Dinotiscus isvicrensis* spec. nov. f#. 7 antenna, 8,.9. lower side of wings, 8. forewing, 9. hind wing. Scales state for forewing 0.2 mm, and for the others 0.1 mm.

between upper margin of toruli and lower margin of median ocellus; combined length of pedicellus and flagellum 1.42x breadth of head; petiole twice as broad as long; gaster 0.91x as long as total length of head plus thorax, and additional some more characters given in the keys.
Host. It was stated in type list.

***Etymology:***

The species refers to Turkish name of Switzerland from which specimens of this species were obtained.

***Diagnosis:***

The new species closely resembles *avrupanensis* in having many characters stated in the key but it differs from *avrupanensis* in having total length of 1-3 funicular segments equal to length of eye; breadth of oral fossa 1.53-1.60x malar space (in *avrupanensis* total length of 1-3 funicular segments 0.83 x length of eye; breadth of oral fossa 1.69-1.75x malar space) and some more characters stated in the key.

***Dinotiscus avrupanensis* sp. n.**
(Figs. 10-13)

***Types Holotype:***

f#, Italy, Pistoia, Abetone Puß, (7.v. 1967), 31.iii 1968, ex: Abies, dichte Aste mit Nadeln, um Boden *Cryphalus*- befall (ZSM).

Paratypes: 2f#, Germany, Oberbayern, Schongau, Schwarzlaichmoor, (5.v. 1973), 15.v. 1973, ex: Sprike, H. Wichmann; 1m#, Switzerland, Engadin, Pontresina, 23.v.1965, H. Wichmann, reared from the branches of *Pinus strobus* (=Zirbe) infected by Ipidae, taken on 30.viii. 1964; 3f#, 2m#, same data as holotype; 1m#, same data as holotype, except 5.ix. 1967; (all of the paratypes were reared by Dr. H.Wichmann) (ZSM).

***Description:***

***Female:***

Length: 1.9-2. 2 mm. Body dark bluish-green, except gaster brown with bluish tint; antennae yellowish-brown to brown, scape dorsally with metallic tint; coxae concolorous with thorax, femora brown, tibiae and tips of femora, tarsi, except pretarsi which is brown, yellow, tibiae in some specimens medially brown. Wings hyaline, venation yellow.

Head in dorsal view about 1.96x as broad as long; temples about 0.41x as long as eyes; POL 1.85 OOL; head in frontal view 1.40 x as broad as height, and 1.19x as broad as width of thorax in front of tegulae;

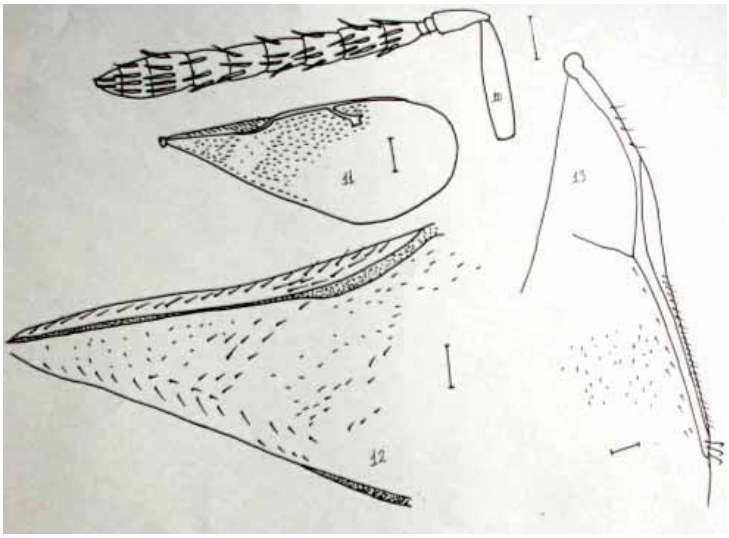

**Fig. 10-13:** *Dinotiscus avrupanensis* spec. nov. f#. 10. antenna, 11-13. lower side of wings, 11. forewing, 12. basal part of forewing, 13. hind wing. Scales state for forewing 0.2 mm, and for the others 0.1 mm.

distance between eyes 1.07-1.22x the distance between notauli in front margin; eyes about 1.15 as long as broad, separated by 1.4x their own length. Malar space 0.56x length of an eye. Breadth of oral fossa 1.70-1.75 x malar space. Head finely reticulated all over. Antennae (Fig. 10): lower edge of toruli level distinctly above the level of lower edge of eyes; scape 0.83x as long as eye, and 1.20-1.27x as long as the distance between upper margin of toruli and lower margin of median ocellus, reaching above level of vertex; combined length of pedicellus and flagellum 1.29x breadth of head; pedicellus 2.57x as long as broad, 1.5x length of first funicular segment; funicular segments with 1$^{st}$ 1.33, 2$^{nd}$ 1.4 longer than broad, 3rd-6$^{th}$ equal in size, 1.20x as long as broad; total length of 1-3 funicular segments 0.83x as long as length of eye; club slightly broader than funiculars, its apical pointed, 2.50x as long as broad, 1.25x as long as two preceding segments together.

Thorax (exl. propodeum) about 1.41x as long as broad. Pronotal collar with distinct carina in whole margin, narrower medially; mesoscutum reticulate, notauli superficial to mid of sclerite; upper part of mesepimeron smooth;. Scutellum slightly wider than long (25: 26), frenal groove indicated laterally. Propodeum about 0.28 x as long as scutellum; median area weakly reticulate; median carina and plicae absent. Fore wing (Fig. 11-12) with marginal vein 1.57x as long as stigmal vein; post marginal vein 1.20x as long as marginal vein and 1. 90 x stigmal vein; stigma almost quadrangular, without fumation; lower side of wing with basal vein bare, basal cell with a row of long hairs on cubital vein, and many small hairs; basal cell closed and speculum open below, with a few hairs below parastigma; disc of wing densely pilose. Hind wings (Fig. 13) with basal vein long; basal part of submarginal vein with 4 hairs; costal cell in basal half bare distal half with a complete row of hairs; disc on lower side below marginal vein with two rows of sparse hairs, 2$^{nd}$ row started from almost the middle of marginal vein, other part of disc with minute hairs having a few long sparse hairs in distal half.

Gastral petiole distinctly broader than long, smooth (5. 3x). Gaster about 1. 36 x as long as head plus thorax (exl. propodeum), acute apically; hind margin of basal tergite (third abdominal) slightly incised medially; last tergite as long as first three segments of hind tarsus; ovipositor sheaths projecting slightly.

Male: Length 1.5-1.6 mm. Similar to female except as follows: mid and hind tibiae brown except for the yellow tips; scape 0.86 x as long as length of eye; pedicellus plus flagellum 1.55x as long as breadth of head; club 1.18x as long as two preceding segments together upper part of mesepimeron weakly reticulated; gaster 0.84x as long as head plus thorax, and some more characters stated in the key.

Host. It was stated in type list.

***Etymology:***

The species refers to Turkish name of Europe from some countries of which the specimens of this species were obtained.

***Diagnosis:***

The new species closely resembles *isvicrensis* in having many characters stated in the key but it differs from *isvicrensis* by the characters given in the diagnosis of *isvicrensis.*

***Dinotiscus tirolensis* sp. n.**

(Figs.14-16)

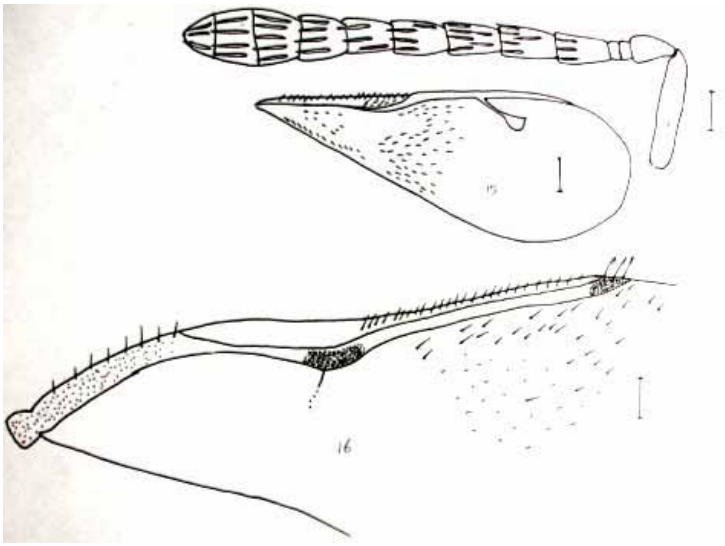

**Fig. 14-16:** *Dinotiscus tirolensis* spec. nov. f#. 14 antenna, 15, 16. lower side of wings, 15. forewing, 16. hind wing. Scales state for forewing 0.2 mm, and for the others 0.1 mm.

***Types Holotype:***

f#, Italy, Tirol, Val Martell, Alpin, 2020 m, 18. viii. 1958, im Rinde, H. Wichman, (ZSM).

Paratype: 1f#, same data as holotype.

***Description:***

***Female:***

Length: 3.0 mm. Body black, with greenish reflection on head, thorax greenish-bronze reflexion; gaster dark bronze-greenish; scape testaceous, dorsally fuscous, metallic reflection, pedicellus metallic black, its ventral tips testaceous, flagellum brown; coxae concolorous with thorax; trochanters yellow; femora black with a weak bluish tint, their tips testaceous; tibiae with 1/3 basal part testaceous, apical 2/3 brown; tarsi yellow, with fifth segments fuscous. Tegulae yellow. Wings sub hyaline, venation mainly testaceous, except stigma brown.

Head in dorsal view about 2. 11-2.16 x as broad as long; temples about 0.31 x as long as eyes; POL 1.66 OOL; head in frontal view 1.39 x as broad as height, and 1.22 x as broad as width of thorax in front of tegulae; distance between eyes 0.88-0.91 x the distance between notauli in front margin; eyes about 1.27 as long as broad, separated by 1.35 x their own length. Malar space 0.67x length of an eye. Breadth of oral fossa 1.47-1.53x malar space. Head finely reticulated all over. Antennae(Fig. 14): lower edge of toruli level distinctly above the level of lower edge of eyes; scape as long as eye, and 1.26 x as long as the distance between upper margin of toruli and lower margin of median ocellus, reaching above level of vertex; combined length of pedicellus and flagellum 1.30 x breadth of head; pedicellus 1. 8 x as long as broad, slightly shorter than length of first funicular segment; funicular segments longer than broad, 1-2 twice, 3-4 1.6x, $5^{th}$ 1.4x and $6^{th}$ slightly longer (8:7); total length of 1-3 funicular segments about as long as length of eye; club slightly broader than funiculars, its apical pointed, twice as long as broad, slightly longer than two preceding segments together.

Thorax (exl. propodeum) about 1.54 x as long as broad. Pronotal collar with distinct carina in whole margin, narrower medially; mesoscutum reticulated, notauli superficial to mid of sclerite; upper part of mesepimeron reticulated or smooth. Scutellum slightly wider than long (34: 33), frenal groove indicated laterally, frenum with slightly broader reticulation than in dorsal of scutellum. Propodeum about 0. 21 x as long as scutellum; median area wholly reticulate; median carina absent; plicae indicated by distinct carinae in hind half and as foveae reaching forward to fore margin. Fore wing (Fig. 15) with marginal vein 1.44 x as

long as stigmal vein; post marginal vein 1.43x as long as marginal vein and 2.06x stigmal vein; stigma semicircular, without fumation; lowerside of wing with basal vein bare, basal cell with a row of long hairs on cubital vein basally, and 10 minute hairs; basal cell closed basally, open apically, speculum open below with only 5 hairs on cubital vein; disc of wing sparsely pilose. Hind wings (Fig. 16) with basal vein short; basal part of submarginal vein with 8 hairs; costal cell basal half bare distal half with a complete row of hairs; disc below marginal vein with sparse, two rows of hairs, a 3rd row started from the middle of marginal vein, other part of disc with minute hairs and with some long hairs in distal half.

Gastral petiole distinctly broader than long (5.5x), smooth. Gaster about 1.50x as long as head plus thorax (exl. propodeum), acute apically; hind margin of basal tergite (third abdominal) slightly incised medially; last tergite as long as first three segments of hind tarsus; ovipositor sheaths projecting slightly.

Male: unknown

Host. It is stated as *Alpin.* in rinde by H. Wichmann

***Etymology:***

The species refers to the range of this species in Italy.

***Diagnosis:***

The new species closely resembles *eupterus* (Walker) and *avrupanensis, isvicrensis* and *zirbecus* in having lower margin of clypeus subtruncate, but it differs from *eupterus* in having mouth openning at most 1.53x malar space (in *eupterus* mouth opening 1.64-1.74x malar space); it differs from *avrupanensis, isvicrensis* in having head dorsally more than twice as broad as long (2.11-2.16x) and eye at least 1.26 x longer than width (in the both species head dorsally at most 1.96 x as broad as long and eye at most 1.18x longer than width); it seems to close to *zirbecus* but it differs from *zirbecus* in having pedicellus plus flagellum 1.30 x as long as broad of head; 6th funicular segment 1.33 x as long as width ( in *zirbecus* pedicellus plus flagellum 1.15x as long as broad of head; 6th funicular segment quadrate) and some more characters stated in the key.

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