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New species of the genus *Chinapenetretus* KURNAKOV 1963 (Coleoptera, Carabidae, Patrobinae) from China

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A b s t r a c t : *Chinapenetretus major* sp.n. from SW Shaanxi, *Ch. xilinensis* sp.n. from C Sichuan, and *Ch. heinzi* sp.n. from E Tibet are described.

K e y w o r d s : Coleoptera, Carabidae, *Chinapenetretus*, new species, China.

Introduction

Since the last key to Chinese *Chinapenetretus* (in the sense of ZAMOTAJLOV 1992) was published (ZAMOTAJLOV & SCIÁKY 1996), important material on this group was collected and studied. It testifies to the great abundance of this genus in S Sichuan and N Yunnan, but some solitary findings in Chinese regions remote from this range were made as well. They are particularly interesting in respect to the genus' general distribution, main trends in its diversification, and probable relations with the other Patrobine groupings. The description of three such species is given below.

Type material is deposited in the collections of the authors (cZA, and cWR), and in the collections of Mr. M. Dvořák, Prague (cDV), Mr. W. Heinz, Schwanfeld (cHZ) and Mr. A. Pütz, Eisenhüttenstadt (cPZ).

***Chinapenetretus major* sp.n.** Figs. 1, 2, 6, 7, 11-15, 20

T y p e m a t e r i a l : Holotype ♂ : China, Shaanxi, Qin Ling Shan, Mt. W pass autoroute km 70, 47 km S Xian, 2500-2600 m, 108.47.E/ 33.51N, 26.-29.VIII. 1995, Wrase leg. (cWR). Paratypes: 5 ♂♂, 13 ♀♀ (cWR); 1 ♂, 1 ♀ (cZA), same locality, together with holotype, 1 ♀, same locality, but A. Pütz leg. (cPZ).

D e s c r i p t i o n : Body dark brown to black, shiny, antennae, mandibles, tibiae, and tarsi brown, palpi reddish-brown. Total length 14.0-16.0 mm. Habitus as in Fig. 1, 2.

Head ovate, stout, 0.75-0.81 (0.78) times as wide as pronotum, eyes large, convex, temples about as long as eye diameter, tumid, neck constriction deep and prominent; frontal furrows more or less shallow, almost parallel to slightly divergent posteriorly; surface smooth, in frontal furrows and in neck constriction densely punctate; 1 seti-

ferous pore near anterior margin of eye and 1 setiferous pore or rarely a bundle of 2 closely situated setae much closer to neck constriction than to posterior margin of eye. Tooth of mentum (Figs. 6, 7) bifid, broad, with deep apical hollow.

Pronotum broad, cordate, 1.13-1.28 (1.21) times as wide as long, somewhat contracted towards base, faintly convex. Front margin almost straight, sides widely rounded in front, gently sinuate before hind angles, basal margin straight, front angles rounded, fairly projecting anteriorly; hind angles obtuse, pointed, distinctly carinate; anterior transverse impression rather shallow, though distinct, sometimes gently rugous; basal foveae deep, rugous, finely punctate, disk smooth, median line deep, somewhat broader basally, obliterated at both extremities, basal area and lateral gutter coarsely punctate; lateral gutter with 4-5 setae, basal seta present in hind angles. Pro-, meso- and metepisterna, lateral areas of mesosternum and metasternum densely and coarsely punctate, lateral areas of sternites rather finely punctate.

Elytra oblong-ovate, 1.66-1.73 (1.70) times as long as wide and 1.39-1.51 (1.45) times as wide as pronotum, widest near middle; disk flat, shoulders broad, prominent, angulate, denticulate; interspaces faintly convex, striae deep, distinctly punctate basally in male, almost smooth in female; interspace 3 with 3-4 setiferous pores adjoining stria 3, marginal series composed of 18-22 pores. Microsculpture forming transverse meshes and wrinkles and irregular minute punctures.

Metatarsomere 5 ventrally with 3-4 couples of setae.

Medianlobe (Figs. 11, 12) large, strongly bent at base, apical lamella faintly curved ventrally (viewed laterally), strongly twisted rightwards (viewed dorsally), apex widely rounded; armature of endophallus consists of a large proximal copulatory piece composed by two fused lobes, a long apical tooth-shaped piece on the left, a teeth-patch, several detaches spinules, and seldom a second smaller apical piece on the right; left paramere (Figs. 13, 15) larger than right one (Fig. 14), both with rather short apical projections, often truncate apically, bearing 2-3 long apical and 1-3 short subapical setae. Spermatheca (Fig. 20) with an elongate asymmetric sclerotized ring ca. 0.93 mm in diameter dorsally, additional adjoining longitudinal sclerotized plates, and sclerotized body between the gonobasis. Stylus bearing 1 minute seta subapically.

Comparisons: The above described species represents an hitherto unknown lineage within *Chinapenetretus*, strongly deviating from the others. However, some important feature, especially the plump, robust head with poor setation, the large, convex eyes, the strongly protruding shoulders and the simple apical lamella of aedeagus readily indicate its generic affiliation. It is noteworthy that the locality of *Ch. major* sp. n. in North-East is very remote from the main range of the genus, situated in SW Sichuan and N Yunnan.

Etymology: The specific epithet refers to the large body (lat. *major*: comparative of *magnus*: large).

***Chinapenetretus xilinensis* sp.n.** Figs. 3, 8, 21

Type material: Holotype ♀: China, C Sichuan, Dayi distr., Chadiping env., 1500 m, 6-7. VIII. 1996, A. Zamotajlov leg. (cZA).

Description: Body black, shiny, antennae, palpi, and tarsi dark brown. Total length 13.7 mm. Habitus as in Fig. 3.

Head ovate, 0.71 times as wide as pronotum, eyes small, faintly convex, temples a little longer than eye diameter, tumid, neck constriction deep; frontal furrows deep, slightly divergent posteriorly; surface smooth, in frontal furrows and in neck constriction punctate, sides of vertex strongly rugous-punctate; 1 setiferous pore near anterior margin of eye and 1 setiferous pore closer to neck constriction than to posterior margin of eye. Tooth of mentum (Fig. 8) bifid, rather narrow and short.

Pronotum broad, cordate, 1.37 times as wide as long, faintly convex. Front margin strongly emarginate, sides widely rounded and explanate, sinuate just before hind angles, basal margin straight, front angles strongly projecting anteriorly, somewhat angulately rounded; hind angles obtuse, pointed; anterior transverse impression rather deep, coarsely punctate, with 3 setae on each side; basal foveae small but rather deep, densely and coarsely punctate, disk faintly rugous, median line punctate, obliterated at both extremities, basal area and lateral gutter coarsely punctate; lateral margins with 5 setae, basal seta present in hind angles. Pro-, mesoepisterna, and mesosternum densely and coarsely punctate, metepisterna, lateral sides of prosternum and mesosternum smoothly punctate, lateral areas of sternite 1 rugous and finely punctate.

Elytra oblong-ovate, 1.65 times as long as wide and 1.34 times as wide as pronotum, convex, sides somewhat rounded, distinctly contracted both posteriorly and anteriorly, lateral margins widely bordered in front, border gradually tapering behind; shoulders narrow but prominent, protruding, denticulate; interspaces faintly convex, striae smooth; interspace 3 with 4 setiferous pores adjoining stria 3 on left elytron and 3 pores on right elytron, marginal series composed of 18-19 pores, rarefied in the middle. Microsculpture fine, forming transverse wrinkles and indistinct meshes.

Metatarsomere 5 ventrally glabrous.

Spermatheca (Fig. 21) with complicated armature: an ovate sclerotized ring about 0.6 mm in diameter dorsally, adjoining a large, strongly sclerotized body, and 2 symmetric sclerotized bodies between the gonobasis; stylus bearing 1 minute seta subapically. Male unknown.

Comparisons: *Ch. xilinensis* sp. n. is related, according to its main features, to *Ch. microphthalmus* (FAIRMAIRE 1886) from Yunnan. It can be distinguished by larger body size, shorter temples, subequal in length to eye diameter, stronger cordate pronotum, more prominently contracted towards base, much deeper emarginated front margin of pronotum, stronger forwards projected front angles of pronotum, obtuse hind angles of pronotum, more narrow shoulders, more numerous pore punctures in marginal series and a different structure of the female reproductive

tract, possessing a large sclerotized body near the ring and other sclerites near the base of the gonobasis.

Etymology: The specific epithet refers to the name of the region, where the species was collected.

***Chinapenetretus heinzi* sp.n.** Figs 4, 5, 9, 10, 16-19, 22

Type material: Holotype ♂: China, E Tibet, Nyingchi NE env., 3700-4500 m, 94.40E/29.37N, 23-25. VII. 1992, L. & R. Businský leg. (cDV). Paratypes: 3 ♂♂, 3 ♀♀ (cDV, cWR); 1 ♂, 1 ♀ (cZA), same locality, together with holotype; 3 ♂♂, 1 ♀ (cDV, cWR), China, E Tibet, W of Brahamaputra great bend, 3400 m, 94.44E/29.40-45N, 21.VII. 1992, L. & R. Businský; 7 ♂♂, 2 ♀♀ (cHZ); 1 ♂, 1 ♀ (cZA), China, Tibet, Nyingtri, SW slope of Serkym-la, 3800-3900 m, 27-28. VI. 1995, W. Heinz leg.

Description: Body black, shiny, mandibles and femora dark brown, antennae, tibiae, and tarsi brown, palpi reddish-brown. Total length 8.3-9.5 mm. Habitus as in Fig. 4, 5.

Head ovate, 0.69-0.74 (0.72) times as wide as pronotum, eyes large, convex, temples subequal in length to eye diameter, faintly tumid, neck constriction rather shallow but prominent; frontal furrows more or less deep, slightly divergent posteriorly; surface smooth, in frontal furrows and in neck constriction densely and coarsely punctate, sides of vertex gently rugous and punctate; 1 setiferous pore near anterior margin of eye and 1 setiferous pore much closer to neck constriction than to posterior margin of eye. Tooth of mentum (Figs. 9, 10) bifid, rather broad.

Pronotum broad, subcordate, 1.15-1.32 (1.24) times as wide as long, faintly convex. Front margin almost straight, sides widely rounded; sinuate just before hind angles, basal margin nearly straight, front angles rounded, not projecting anteriorly; hind angles obtuse to rectangular, pointed; anterior transverse impression rather deep and broad, densely and coarsely punctate, sometimes with 1 seta laterally; basal foveae deep, densely and coarsely punctate, disk smooth, median line fine, obliterated at both extremities, basal area and lateral gutter densely and coarsely punctate; lateral sides with 4-5 setae, basal seta present in hind angles. Pro- and mesepisterna, sides of prosternum and metasternum, mesosternum and metepisterna coarsely punctate, lateral areas of sternite 1 rugous.

Elytra oblong-ovate, slightly convex, 1.51-1.67 (1.59) times as long as wide and 1.36-1.47 (1.42) times as wide as pronotum, widest near middle; disk flat, shoulders narrow, rounded, though prominent, slightly denticulate; interspaces faintly convex, interspaces 3 and 5 often prominently wider than others, striae deep, slightly punctate basally, sometimes irregularly curved; interspace 3 with 3, rarely 4 setiferous pores adjoining stria 3, often represented as large foveoles, marginal series composed of 8-12 pores subinterrupted in the middle and forming basal (3-5 setae) and apical (4-7 setae) groups. Microsculpture forming fine indistinct transverse meshes.

Metatarsomere 5 ventrally with 2-4 couples of setae.

Median lobe (Figs. 16, 17) strongly bent at base, apical lamella fairly curved ventrally (viewed laterally), strongly attenuate towards apex (viewed dorsally); apex pointed, right margin reflexed, forming small tooth-shaped protuberance; armature of endophallus consists of a large proximal copulatory piece composed by two fused lobes and membranous spinulate apical structures; left paramere (Fig. 18) larger than right one (Fig. 19), both with long apical projections bearing 2 long apical and usually 1-2 short setae, remote from the apex. Spermatheca (Fig. 22) with an ovate broad sclerotized ring ca. 0.7 mm in diameter dorsally and sclerotized body between the gonobasis.

Comparisons: Both morphologically and geographically *Ch. heinzi* sp. n. is strongly detached from the known congeners, although, based on well-developed head punctuation, shape of pronotum, and denticulate apex of aedeagus, it must be put closer to *Ch. microphthalmus* (FAIRMAIRE) and apparently *Ch. xilinensis* sp. n.

Etymology: This species is cordially dedicated to our colleague, indefatigable investigator of Carabid beetles, Dipl.-Ing. Walter Heinz (Schwanfeld), who kindly allowed us to study his material.

Acknowledgements

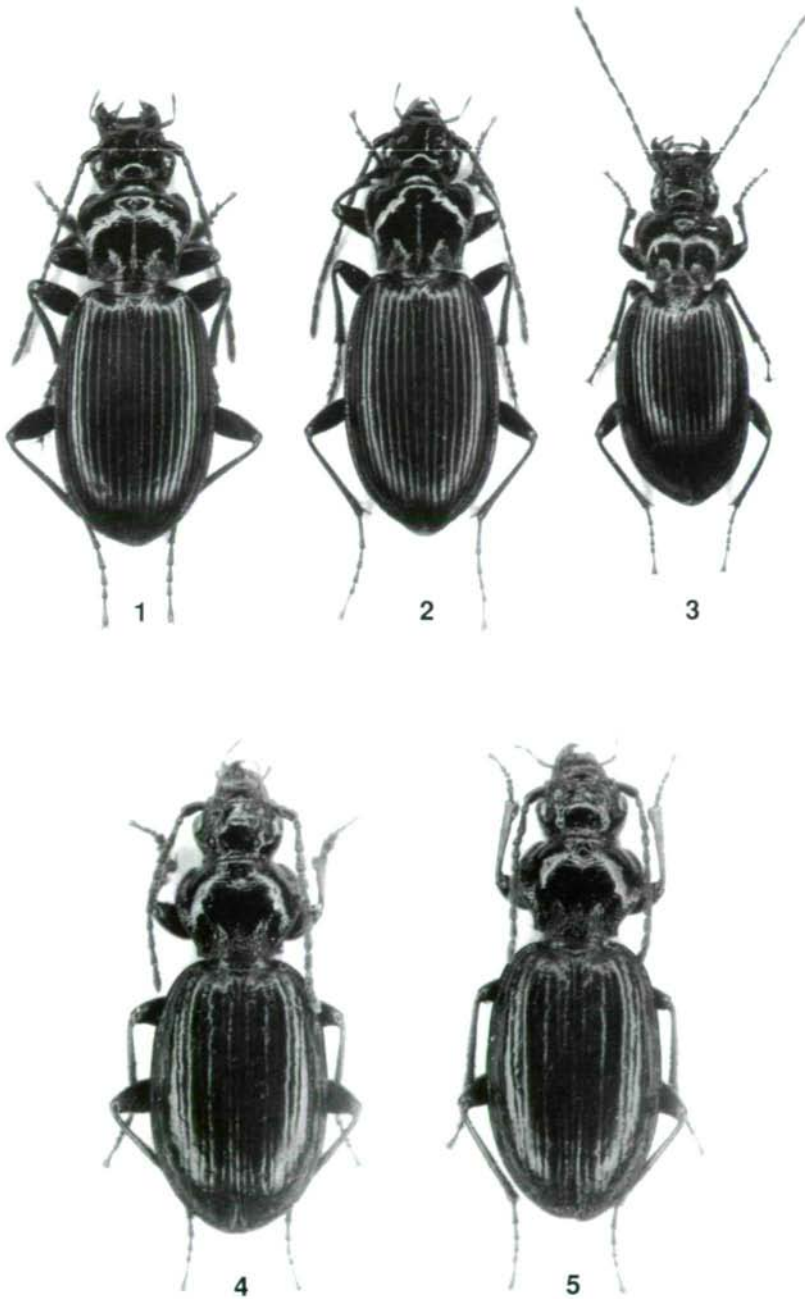
The authors are much obliged to Mr. M. DVOŘÁK (Prague, Czech Republic), Dipl.-Ing. W. HEINZ (Schwanfeld, Germany) and Mr. A. PÜTZ (Eisenhüttenstadt, Germany), who collaborated in this work by allowing us to study their interesting material.

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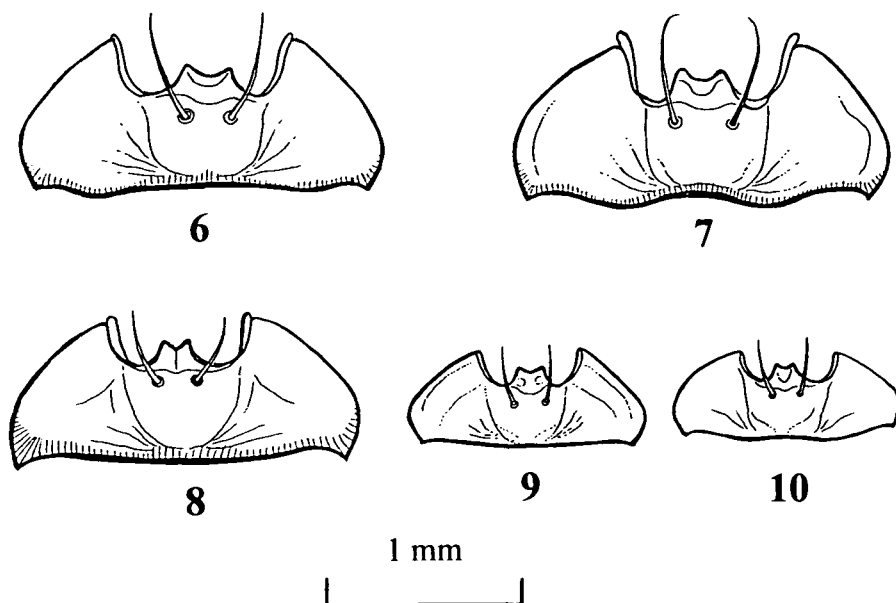
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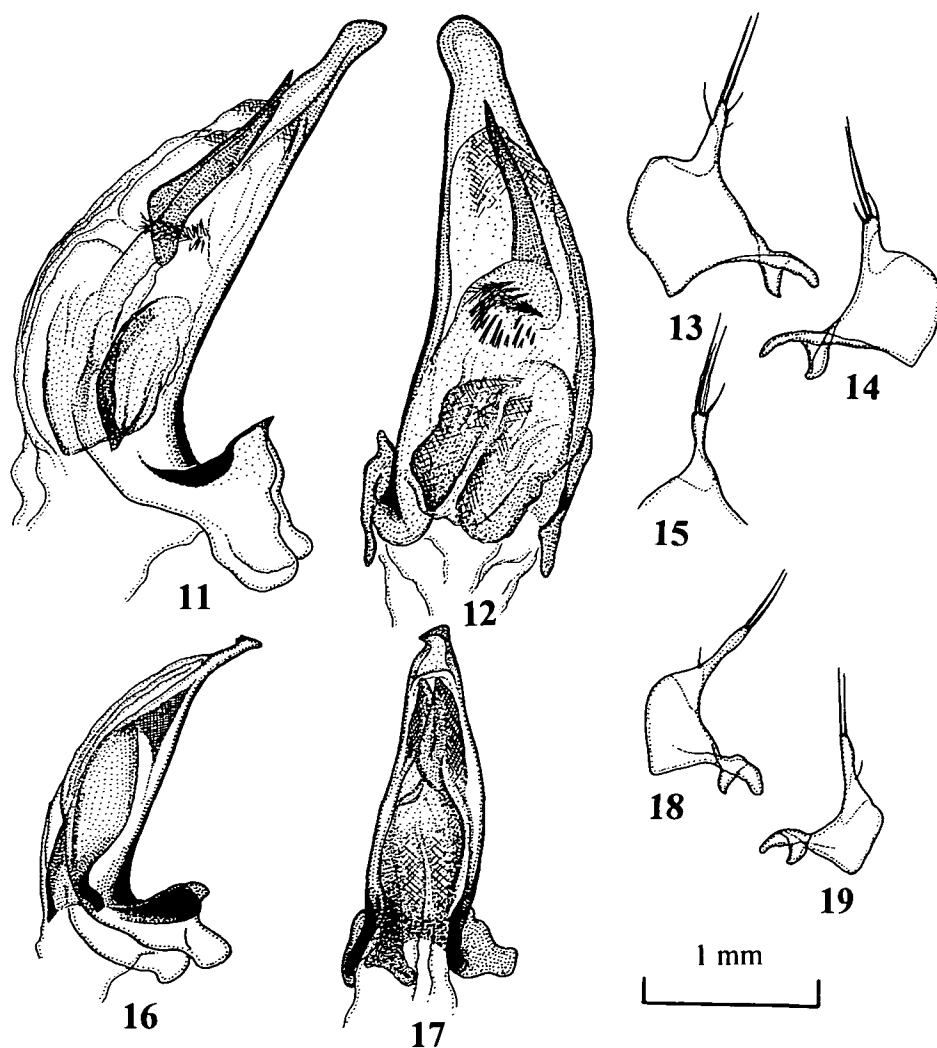
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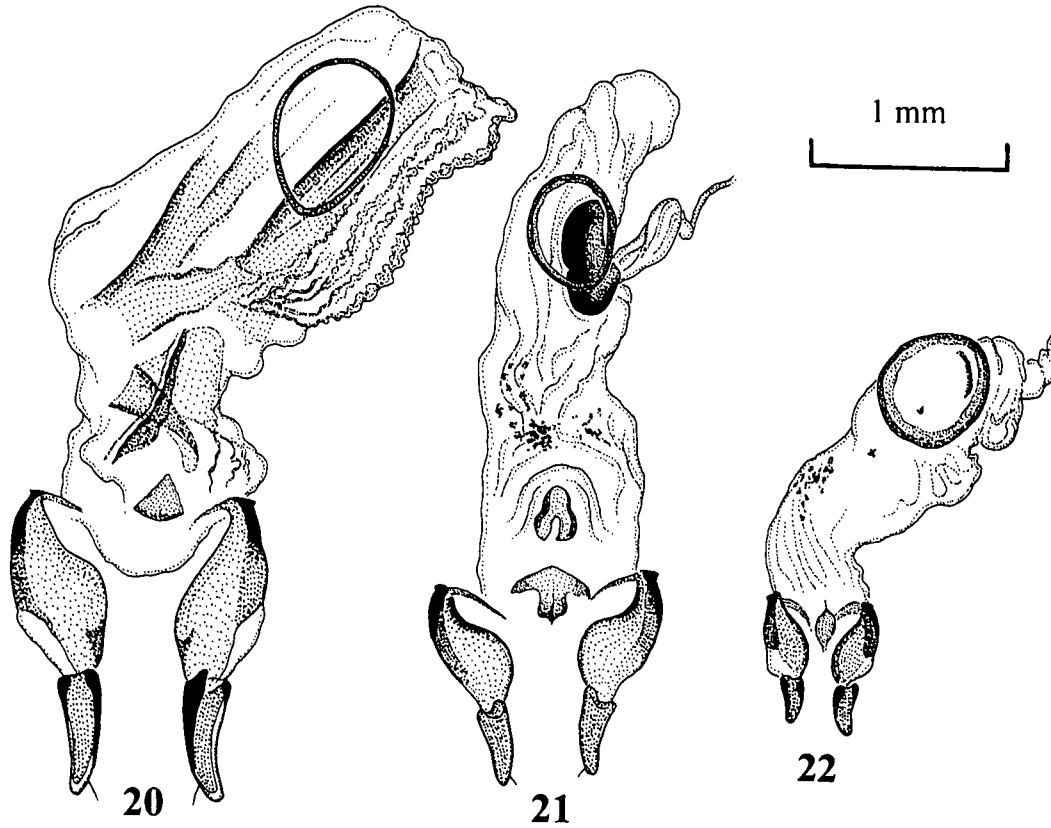
Figs. 1-5: *Chinapenetretus* sp., general view. 1 - *Ch. major* sp.n. (PT ♂). 2 - *Idem* (PT ♀). 3 - *Ch. xilinensis* sp. n. (HT ♀). Figs. 4-5: *Chinapenetretus heinzi* sp. n., general view. 4 - PT ♂. 5 - PT ♀.



Figs. 6-10: *Chinapenetretus* sp., mentum. 6 - *Ch. major* sp.n. (PT ♂). 7 - *Idem* (PT ♀). 8 - *Ch. xilinensis* sp.n. (HT ♀). 9 - *Ch. heinzi* sp.n., PT ♂. 10 - *Idem*, PT ♀.



Figs. 11-19: *Chinapenetretus* sp., male genitalia. 11-14: *Ch. major* sp.n. (HT). 15 - idem, PT. 16-19: *Ch. heinzi* sp.n. (HT). 11, 16: Median lobe, left lateral view. 12, 17: Median lobe, dorsal view. 13, 15, 18: Left paramere, left lateral view. 14, 19: Right paramere, right lateral view.



Figs. 20-22: *Chinapenetretus* sp., female reproductive tract. **20** - *Chinapenetretus major* sp.n. (PT). **21** - *Ch. xilinensis* sp.n. (HT). **22** - *Ch. heinzi* sp.n. (PT).

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