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## LIST OF CHINESE TURTLES, CROCODILIANS, AND SNAKES, WITH KEYS<sup>1</sup>

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The contents of this paper have been taken from the completed manuscript of a work by me on the reptiles of China, which is to appear soon as volume X of 'The Natural History of Central Asia,' a series of twelve volumes now in course of preparation and publication by the American Museum. The vast material collected in China and Mongolia by members of the Central Asiatic Expeditions, under the leadership of Roy Chapman Andrews, forms the basis of these volumes.

The object of this paper is to present a list, together with means of identification, of all the valid forms of turtles, crocodilians, and snakes known with certainty to inhabit China northward to a line connecting the head of the Liaotung Gulf with the northernmost point of Kansu, and westward as far as the western boundaries of Chinghai and Hsi-kang. Keys for identification of all listed forms are included. Many of these keys, especially the longer ones, are entirely new.

The numerous differences between the present list and the one published by Mell in 1931 (*Lingnan Sci. Jour.*, VIII, pp. 199-219) are due largely to my more conservative attitude in regard to the recognition of subspecies. Also, I hold that a subspecies is a form that has been shown to intergrade with another form.

The following points, arranged in three groups for convenience of reference, must be remembered in using the list and keys.

1.—Only the Chinese distribution of each form is given. Those forms known to occur only within the limits of China as outlined above are marked with an asterisk. Although listed occasionally, Hongkong is not considered a part of China.

2.—A rather wide distribution within a province is indicated when no specific localities are given. If no specific record exists for a province, the name of the province is followed by the abbreviated phrase "no loc." in parentheses. Due to its peculiar shape, sections of Szechwan are not easily designated by the use of the points of the compass; therefore, in some cases, the mention of Szechwan alone does not imply a distribution over the entire province.

3.—Only well-authenticated locality records are included.

<sup>1</sup>Publications of the Asiatic Expeditions of The American Museum of Natural History. Contribution No. 127.

4.—The keys are specifically constructed for the identification of material from China as already delimited and should not be fully depended upon for specimens from adjacent regions.

5.—All available literature published previous to January 1, 1934, has been included as well as a few papers dated 1934.

TURTLES (key p. 14)

**DERMOCHELIDAE**

**DERMOCHELYS** Blainville

**Dermochelys coriacea** (Linnaeus).

Amoy.

**CHELONIIDAE** (key p. 15)

**ERETMOCHELYS** Fitzinger

**Eretmochelys imbricata** (Linnaeus).

Hainan region.

**CHELONIA** Latreille

**Chelonia mydas** (Linnaeus).

Islands near Hongkong.

**CARETTA** Rafinesque

**Caretta caretta olivacea** (Eschscholtz).

Hwangpu; between Four Sisters and Two Brothers Islands, east of Chusan.

**PLATYSTERNIDAE**

**PLATYSTERNON** Gray

**Platysternon megacephalum** Gray.

Kwangtung and Kwangsi; north along coast to region of Foochow.

**TESTUDINIDAE** (key p. 15)

**CYCLEMYS** Bell (key p. 15)

\***Cyclemys flavomarginata sinensis** Hsü.

Chunshan in Tungting Lake.

**Cyclemys mouhotii** Gray.

Namfong on Hainan.

\***Cyclemys trifasciata** (Bell).

Southern Kwangtung; Shihwantashan in southwestern Kwangsi.

\***Cyclemys yunnanensis** Boulenger.

Yunnanfu and Tungchwan in Yunnan.

**GEOEMYDA** Gray

**Geoemyda spengleri spengleri** (Gmelin).

Kwangtung (no loc.); Kwangsi.

**CLEMMYS** Ritgen (key p. 16)

\***Clemmys bealei** (Gray).

Futsing Hsien and region of Foochow in Fukien.

**Clemmys mutica** (Cantor).

Kunshan in Kiangsu; Ningpo and Chusan in Chekiang; Ningkwo in Anhwei; Hainan.

\***Clemmys nigricans** (Gray).

Southern China, probably Kwangtung.

**Clemmys quadriocellata** Siebenrock.

Lofaoshan, Hsiaokeng and Hainan in Kwangtung; Lohsiang and Shihwantashan in Kwangsi.

**GEOCLEMMYS** Gray (key p. 16)

\***Geoclemmys kwangtungensis** Pope.

Hsiaokeng, Lofaoshan and Tinghushan in Kwangtung.

**Geoclemmys reevesii** (Gray).

Widely distributed in China where it is frequently transported by human agencies.

**OCADIA** Gray

**Ocadia sinensis** (Gray).

Hainan and mountains east of Shiuchow in Kwangtung; other somewhat uncertain records for more northern localities.

**PSEUDOCADIA** Lindholm

\***Pseudocadia anyangensis** (Ping).

Ancient ruins of Anyang Hsien in Honan; apparently extinct.

**TESTUDO** Linnaeus

**Testudo elongata** Blyth.

Living specimen purchased from a village near Nanning in Kwangsi.

**TRIONYCHIDAE** (key p. 16)

**PELOCHELYS** Gray

**Pelochelys bibroni** (Owen).

Region of Nodoa on Hainan; Foochow; repeatedly observed for sale in Canton market.

**AMYDA** Oken (key p. 16)

**Amyda sinensis** (Wiegmann).

Widely distributed in China.

**Amyda steindachneri** (Siebenrock).

Kwangtung (no loc.); Kwangsi; probably Kweichow.

## CROCODILIANS

**ALLIGATORIDAE****ALLIGATOR** Cuvier**\*Alligator sinensis** Fauvel.

Lower Yangtze Valley, chiefly in the region of Wuhu and Taihu.

## SNAKES (key p. 16)

**TYPHLOPIDAE****TYPHLOPS** Oppel**Typhlops braminus** (Daudin).

Kwangtung; northward from Kwangtung to Changning and Nanan, in southern Kiangsi, and Foochow and Yenping in Fukien.

**BOIDAE** (key p. 17)**PYTHON** Daudin**Python molurus bivittatus** Schlegel.

Yuankiang in southern Yunnan; Kwangtung; Yenping in Fukien.

**ERYX** Daudin**Eryx miliaris roborowskii** Bedriaga.

Sachow in Kansu; Edsin gol and fifty-five miles northwest of Ningsia in Ningsia.

**XENOPELTIDAE****XENOPELTIS** Reinwardt**Xenopeltis unicolor** Reinwardt.

Wuyung in Kwangtung.

**COLUBRIDAE** (key p. 17)**Colubrinae** (key p. 18)**SIBYNOPHIS** Fitzinger (key p. 20)**Sibynophis chinensis** (Guenther).

Widely distributed in southern and central China; no record for Yunnan.

**Sibynophis collaris** (Gray).

Husa Valley in extreme western Yunnan.

**\*Sibynophis grahami** (Boulenger).

Yunnanfu, between Yunnanfu and Kutsing, and Wutingchow in Yunnan.

**Natrix** Laurenti (key p. 20)

\***Natrix aequifasciata** Barbour.

Lohsiang in eastern Kwangsi; Kwangtung; Futsing Hsien, Foochow and Yenping in Fukien.

**Natrix annularis** (Hallowell).

Northern Fukien; northern and eastern Kiangsi; southern Anhwei; southern Kiangsu; Chekiang.

**Natrix bitaeniata** Wall.

Extreme western Yunnan.

**Natrix chrysarga** (Schlegel).

Hainan.

\***Natrix craspedogaster** (Boulenger).

Eastern central China south of the Yangtze River; from Yachow southeastward to the Yunnan border south of Süchow in Szechwan.

\***Natrix johannis** (Boulenger).

Wutingchow region and Yunnanfu in Yunnan; Luningying ( $28^{\circ} 27' \times 101^{\circ} 43'$ ) and Omei Hsien in Szechwan.

**Natrix nuchalis** (Boulenger).

Northern Yunnan; Chiulung Hsien in Hsikang; Muping region, Washan region, Mt. Omei and Süchow in Szechwan; Ichang in Hupeh.

\***Natrix octolineata** (Boulenger).

Central and northern Yunnan; southern Szechwan.

\***Natrix ornaticeps** (Werner).

Hainan; Lohsiang in eastern Kwangsi.

**Natrix percarinata** (Boulenger).

Southern and central China, south of the Yangtze in the east; Szechwan.

**Natrix piscator** (Schneider).

Widely distributed in extreme southern China, extending its range northward in the east to Wenchow in Chekiang and Hokow in northeastern Kiangsi.

\***Natrix popei** Schmidt.

Lohsiang in eastern Kwangsi; Linping and Hainan in Kwangtung.

**Natrix sauteri** (Boulenger).

Lohsiang in eastern Kwangsi; Linping in northern Kwangtung; southern Fukien; Chouchiakou (southeast of Süchow) in Szechwan.

**Natrix stolata** (Linnaeus).

Widely distributed in extreme southern China, extending its range northward in the east to Tunglu and the Chusan Islands in Chekiang and Hokow in northeastern Kiangsi; extreme western Yunnan.

**Natrix subminiata subminiata** (Schlegel) (see key p. 22).

Hainan.

**Natrix subminiata helleri** Schmidt.

Yenping in Fukien; Kwangtung; Lohsiang in Kwangsi; Hwang-tsaopa in southwestern Kweichow; northern and extreme western Yunnan.

**Natrix tigrina lateralis** (Berthold).

Widely distributed in central and northern China.

**PSEUDOZENODON** Boulenger (key p. 22)

\***Pseudoxenodon bambusicola** Vogt.

Hainan and northern Kwangtung; Lohsiang in eastern Kwangsi; Futsing Hsien and Yenping in Fukien.

\***Pseudoxenodon dorsalis** (Guenther).

Chekiang (no loc.).

\***Pseudoxenodon fukienensis** Pope.

Chungan Hsien in northwestern Fukien.

\***Pseudoxenodon karlschmidti karlschmidti** Pope (see key p. 23)

Chungan Hsien and Yenping in Fukien.

\***Pseudoxenodon karlschmidti sinii** Fan.

Yaoshan in eastern Kwangsi; Kwangtung.

**Pseudoxenodon macrops macrops** (Blyth) (see key p. 23).

Eastern Hsikang; western and probably southern Yunnan.

\***Pseudoxenodon macrops sinensis** Boulenger.

Southwestern Szechwan; Yunnan plateau.

\***Pseudoxenodon striaticaudatus** Pope.

Chungan Hsien in northwestern Fukien.

**HELICOPS** Wagler

\***Helicops yunnanensis** (Anderson).

Extreme western Yunnan.

**MACROPISTHODON** Boulenger

**Macropisthodon rudis** Boulenger.

Foochow and Chungan Hsien in northern Fukien; northern Yunnan; ascent from Yenyuan to Santashan in southwestern Szechwan.

**OPISTHOTROPIS** Guenther (key p. 23)

**Opisthotropis andersonii** (Boulenger).

Hongkong.

**Opisthotropis balteata** (Cope).

Hainan and Wyung (east of Canton) in Kwangtung; Lohsiang in eastern Kwangsi.

\***Opisthotropis kuatunensis** Pope.

Chungan Hsien in northwestern Fukien.

**Opisthotropis lateralis** Boulenger.

Yaoshan in eastern Kwangsi.

\***Opisthotropis latouchii** (Boulenger).

Extreme northern Kwangtung; from Futsing Hsien to Chungan Hsien in Fukien; Pingsiang in Kiangsi.

\***Opisthotropis maxwelli** Boulenger.

Southern Fukien.

**RHABDOPS** Boulenger

**Rhabdops bicolor** (Blyth).

Chanta Valley in extreme western Yunnan.

**TRIRHINOPHOLIS** Boulenger

\***Trirhinopholis styani** Boulenger.

Chungan Hsien in Fukien; Mokanshan in northern Chekiang; Wangwanshan in southeastern Anhwei; Kuling in northern Kiangsi; Mt. Omei in Szechwan.

**ACHALINUS** Peters (key p. 23)

**Achalinus rufescens** Boulenger.

Namkao (Hainan) and between Linping and Chungsun in Kwangtung; Lohsiang in eastern Kwangsi; Fukien (no loc.).

**Achalinus spinalis** Peters.

Eastern Chekiang; Chungan Hsien in Fukien; northern and eastern Kiangsi; Nanking in Kiangsu; Ichang in Hupeh; Chouchiakou, Süchow, Mt. Omei and Washan in Szechwan.

**LYCODON** Boie (key p. 24)

**Lycodon aulicus aulicus** (Linnaeus).

Amoy; Pangsi in extreme western Yunnan.

**Lycodon fasciatus** (Anderson).

Northern and extreme western Yunnan; Ningyuan in southwestern Szechwan.

**Lycodon ruhstrati** (Fischer).

Huangchiakou (southeast of Süchow) and Mt. Omei in Szechwan; the Lushan in Kiangsi; Chungan Hsien and Futsing Hsien in Fukien; Lungtou in northern Kwangtung.

**Lycodon subcinctus** Boie.

Hainan and Foochow.

**DINODON** Duméril (key p. 24).**\*Dinodon flavozonatum** Pope.

Chungan Hsien in Fukien; between Linping and Chunghsin in northern Kwangtung.

**Dinodon rufozonatum** (Cantor).

Widely distributed in northern and central China.

**ZAOCCYS** Cope (key p. 24)**\*Zaocys dhumnades dhumnades** (Cantor) (see key p. 24).

Plains and lower mountains of central China.

**Zaocys dhumnades montanus** Pope.

Higher mountains of central and southern China.

**Zaocys nigromarginatus** (Blyth).

Ningyuan and Lushuiho in southwestern Szechwan; Tengyueh, twenty miles north of Yunnanfu and Yunnanfu in Yunnan.

**PTYAS** Fitzinger (key p. 24)**Ptyas korros** (Schlegel).

Tunglu and Taichow in Chekiang; Hokow and Kiukiang in Kiangsi; Fukien; Kwangtung; Yaoshan in Kwangsi; Hsikwangshan in Hunan; Yuankiang and Chanta and Husa Valleys in Yunnan.

**Ptyas mucosus** (Linnaeus).

Taichow and Wenchow in Chekiang; Ichang in Hupeh; Hokow in Kiangsi; Fukien; Kwangtung; Yaoshan in Kwangsi; Tengyueh in Yunnan; Batang in Hsikang.

**COLUBER** Linnaeus**Coluber spinalis** (Peters).

Widely distributed in northern China.

**ELAPHE** Fitzinger (key p. 24)**\*Elaphe bimaculata** Schmidt.

From Hankow eastward to Hangechow and Chinkiang.

**Elaphe carinata** (Guenther).

Widely distributed in central China.

**Elaphe davidi** (Sauvage).

Chihfeng in Jehol; the Tungling near Moukden.

**Elaphe dione** (Pallas).

Widely distributed over northern China; Shanghai.

**Elaphe frenata** (Gray).

Chungan Hsien and Yenping in Fukien; Chayuanshan and Lung-tou in northern Kwangtung.

**Elaphe mandarinus** (Cantor).

Chekiang; Chungan Hsien in Fukien; Wanszushan in northern Kwangtung; Kweichow (no loc.); Szechwan.

**Elaphe moellendorffi** (Boettger).

Nanning in Kwangsi; Canton, Wuyung and Namkong (east of Canton) in Kwangtung.

\***Elaphe perlacea** Stejneger.

Yachow Prefecture in Szechwan.

**Elaphe porphyracea porphyracea** (Cantor) (see key p. 26).

Opien Hsien in Szechwan; north central and extreme western Yunnan.

**Elaphe porphyracea nigrofasciata** (Cantor).

Hainan, Lofaoshan and Lungtou in Kwangtung; Lohsiang in eastern Kwangsi; Fukien; Ningpo region in Chekiang.

**Elaphe prasina** (Blyth).

Pupiao, Imen Hsien and Wutingchow in Yunnan.

**Elaphe radiata** (Schlegel).

Southern Fukien; regions east and west of Canton in Kwangtung; Lohsiang in eastern Kwangsi; Yuankiang in southern Yunnan.

**Elaphe rufodorsata** (Cantor).

Central China east of Hankow and north of northern Fukien; northeastern China.

**Elaphe schrenckii anomala** (Boulenger).

Chihfeng in Jehol; Hsinglungshan, Peiping and the Western Hills in Hopei; Hululi (sixty-five miles southwest of Taiyuan) in Shansi; Tsingtao in Shantung.

**Elaphe taeniurus** Cope.

Widely distributed through southern, central and northeastern China.

**RHYNCHOPHIS** Mocquard

**Rhynchophis boulengeri** Mocquard.

Yaoshan in eastern Kwangsi.

**DENDROPHIS** Fitzinger

**Dendrophis boiga boiga** (Lacépède).

Hainan; Lungling in western Yunnan.

**EURYPHOLIS** Hallowell (key p. 26)**Eurypholis doriae** (Boulenger).

Hokow in southeastern Yunnan.

**Eurypholis major** (Guenther).

Central and southeastern China, south of the Yangtze River in the east.

**Eurypholis multicinctus** (Roux).

Lohsiang in eastern Kwangsi.

**CORONELLA** Laurenti**\*Coronella bella** Stanley.

Kuatun in northwestern Fukien.

**HOLARCHUS** Cope (key p. 26)**Holarchus chinensis** (Guenther).

From Lohsiang in Kwangsi northeastward to Nanking and Kiangyin in Kiangsu; Yunnanfu.

**Holarchus formosanus** (Guenther).

Wenchow in Chekiang; Hokow and Nanchang in Kiangsi; Fukien; Kwangtung; Yaoshan in eastern Kwangsi.

**Holarchus violaceus** (Cantor).

Southeastern coastal region as far north as Spider Island, Foochow and Yenping in Fukien.

**OLIGODON** Boie (key p. 26)**Oligodon eberhardti** Pellegrin.

Lohsiang in eastern Kwangsi.

**\*Oligodon ornatus musyi** (Roux).

Chungan Hsien in northwestern Fukien.

**CALAMARIA** Boie (key p. 26)**Calamaria pavimentata pavimentata** Duméril and Bibron.

Lungan and Muping in Szechwan; Lohsiang in eastern Kwangsi; Canton region.

**Calamaria septentrionalis** Boulenger.

Southeastern China north to the Yangtze.

**Homalopsinae****ENHYDRIS** Latreille (key p. 26)**Enhydriis bennettii** (Gray).

Hainan.

**Enhydriis chinensis** (Gray).

Ichang in Hupeh; Nanking in Kiangsu; Wenchow in Chekiang; Hokow and Changning in Kiangsi; Fukien; Kwangtung.

**Enhydris enhydris** (Schneider).

No definite Chinese locality known; Hongkong.

**Enhydris plumbea** (Boie).

Wenchow in Chekiang; Fukien; Kwangtung.

**Boiginae** (key p. 27)

**CHRYSOPELEA** Boie

**Chrysopelea ornata** (Shaw).

Fukien (no loc.).

**TAPHROMETOPON** Brandt

**Taphrometopon lineolatum** (Brandt).

Sachow in Kansu; Ningsia region and Alashan in Ningsia.

**AHAETULLA** Link

**Ahaetulla prasina** (Boie).

Hokow in southeastern Yunnan; Yaoshan in eastern Kwangsi; Lofaoshan in Kwangtung.

**PSAMMODYNASTES** Guenther

**Psammodynastes pulverulentus** (Boie).

Fukien; Kwangtung; Yaoshan in eastern Kwangsi; Wutingchow in Yunnan.

**BOIGA** Fitzinger (key p. 27)

**Boiga kraepelini** Stejneger.

Yaoshan in eastern Kwangsi; Yuanshan in northeastern Kiangsi; Chungan Hsien and Futsing Hsien in Fukien; Süchow in Szechwan.

**Boiga multomaculata** (Boie).

Lohsiang in eastern Kwangsi; Kwangtung; Changning in southern Kiangsi; Futsing Hsien in Fukien.

**ELAPIDAE** (key p. 27)

**BUNGARUS** Daudin (key p. 27)

**Bungarus fasciatus** (Schneider).

Fukien (no loc.); Kwangtung; Lohsiang in eastern Kwangsi; Kutung and Hokow (28° 15' × 117° 41') in Yunnan.

**Bungarus multicinctus multicinctus** Blyth (see key p. 27).

Southeastern China; eastern central China north to the Yangtze River.

**Bungarus multicinctus wangaotingi** Pope.

Yuankiang in southern Yunnan.

**CALLIOPHIS** Gray**Calliophis macclellandi** (Reinhardt).

Lushan and Pingsiang in Kiangsi; Chungan Hsien in northwestern Fukien; Kwangtung; Lohsiang in eastern Kwangsi.

**HEMIBUNGARUS** Peters**\*Hemibungarus kelloggi** Pope.

Chungan Hsien, Yenping, and Futsing Hsien in Fukien; Lohsiang in Kwangsi.

**NAJA** Laurenti (key p. 27)**Naja hannah** (Cantor).

Foochow region; Kwangtung; Lohsiang in eastern Kwangsi.

**Naja naja atra** Cantor.

Chekiang; Kiukiang, and Hokow in northern Kiangsi; Fukien; southwestern Hunan; Lohsiang in eastern Kwangsi; Kwangtung.

**HYDROPHIIDAE** (key p. 28)**THALASSOPHINA** Smith**Thalassophina viperina** (Schmidt).

Hainan and Swatow in Kwangtung.

**HYDROPHIS** Latreille (key p. 28)**Hydrophis caeruleus** (Shaw).

Tsingtao in Shantung; Swatow in Kwangtung.

**Hydrophis cyanocinctus** Daudin.

Hoihow and Hainan Strait; Foochow; Yenting in Chekiang; Shanghai.

**Hydrophis melanocephalus** Gray.

Wenchow in Chekiang.

**Hydrophis ornatus ornatus** (Gray).

Tsingtao in Shantung.

**LAPEMIS** Gray**Lapemis hardwickii** Gray.

Tsingtao in Shantung.

**PELAMYDRUS** Stejneger**Pelamydrus platurus** (Linnaeus).

Hoihow and Swatow in Kwangtung.

**MICROCEPHALOPHIS** Lesson

**Microcephalophis gracilis gracilis** (Shaw).

Hainan region.

**AMBLYCEPHALIDAE**

**AMBLYCEPHALUS** Kuhl (key p. 28)

\***Amblycephalus boulengeri** Angel.

Kweichow (no loc.); Wanhsien region in eastern Szechwan.

\***Amblycephalus chinensis** Barbour.

Szechwan.

\***Amblycephalus kuangtungensis** Vogt.

Chungan Hsien in northwestern Fukien; Lofaoshan and Lungtou in Kwangtung; Lohsiang in eastern Kwangsi.

**Amblycephalus moellendorffi** (Boettger).

Hainan and Lofaoshan in Kwangtung; Lohsiang in eastern Kwangsi.

\***Amblycephalus niger** Pope.

Yunnanfu.

\***Amblycephalus stanleyi** Boulenger.

Chungan Hsien in northwestern Fukien.

**Amblycephalus tonkinensis** Angel.

Hainan.

\***Amblycephalus yunnanensis** Vogt.

Tali region in Yunnan.

**VIPERIDAE** (key p. 29)

**AZEMIOPS** Boulenger

**Azemiops feae** Boulenger.

Yenchinghsi (Opieen Hsien) and Chouchiakou (southeast of Süchow) in Szechwan; Pingsiang in Kiangsi.

**VIPERA** Laurenti

**Viperi russelii siamensis** Smith.

Wuyung and Namkong (both east of Canton) in Kwangtung.

**CROTALIDAE** (key p. 29)

**AGKISTRODON** Beauvois (key p. 29)

**Agkistrodon acutus** (Guenther).

Ichang and Wusüeh in Hupeh; Shenchow in Hunan; Mokanshan in Chekiang; Chungan Hsien in Fukien; northern Kwangtung.

**Agkistrodon halys** (Pallas).

Widely distributed in northern and central China.

**\*Agkistrodon monticola** Werner.

Mountains just north and slightly west of Likiang in Yunnan.

**\*Agkistrodon strauchi** (Bedriaga).

Hsikang; Sungpan in northwestern Szechwan.

**TRIMERESURUS** Lacépède (key p. 29)**Trimeresurus albolabris** Gray.

Fukien; Kwangtung; Yaoshan in eastern Kwangsi.

**Trimeresurus jerdonii** Guenther.

Northern Yunnan; Szechwan; Ichang in Hupeh.

**Trimeresurus monticola** Guenther.

Tali region and Husa in Yunnan; Szechwan; Chekiang (no loc.); Chungang Hsien and Shaowu in northwestern Fukien.

**Trimeresurus mucrosquamatus** (Cantor).

Fukien; northern Kwangtung; Yaoshan in eastern Kwangsi; Szechwan.

**Trimeresurus stejnegeri stejnegeri** Schmidt (see key p. 29).

Yaoshan in eastern Kwangsi; Hainan and northern Kwangtung; Fukien; Tunglu, Mokanshan and the Ningpo region in Chekiang; Taolin (near Changsha) in Hunan.

**Trimeresurus stejnegeri yunnanensis** Schmidt.

Yunnanfu, Luchuan, Tali, and Tengyueh in Yunnan.

## KEYS FOR IDENTIFICATION

**TESTUDINATA**

- I.—Limbs clawless; carapace with seven prominent, longitudinal ridges; size gigantic; marine. . . . . **DERMOCHELIDAE.**
- II.—Limbs with one or more claws; carapace without seven longitudinal ridges.
- A.—Shell covered with horny shields.
- 1.—Digits not distinct; limbs paddle-shaped with one or two claws; size large; marine. . . . . **CHELONIIDAE.**
- 2.—Limbs not paddle-shaped; digits distinct; four or five claws present; not marine.
- a.—Plastral shields separated from marginals by infra-marginals. . . . . **PLATYSTERNIDAE.**
- b.—Inframarginals lacking, plastral shields in contact with marginals. . . . . **TESTUDINIDAE.**
- B.—Shell covered with soft skin. . . . . **TRIONYCHIDAE.**

**CHELONIIDAE**

- I.—Four pairs of costal shields, the first separated from nuchal by the anterior vertebral.
  - A.—Two pairs of prefrontals; dorsal shields strongly imbricate in early life, becoming juxtaposed with age. . . . . *ERETMOCHELYS*.
  - B.—A single pair of prefrontals; dorsal shields juxtaposed. . . . . *CHELONIA*.
- II.—Five or more pairs of costal shields, the first in contact with nuchal; two pairs of prefrontals; dorsal shields juxtaposed. . . . . *CARETTA*.

**TESTUDINIDAE**

- I.—Limbs more or less flattened; digits webbed; top of head covered anteriorly with undivided skin; costal plates not wedge-shaped with alternating broad and narrow ends.
  - A.—Hexagonal neural plates short-sided behind.
    - 1.—Plastron hinged; plastron connected with carapace by a ligament. . . . . *CYCLEMYS*.
    - 2.—Plastron not hinged; plastron directly united with carapace. . . . . *GEOEMYDA*.
  - B.—Hexagonal neural plates short-sided in front; plastron not hinged; plastron directly united with carapace.
    - 1.—Entoplastron intersected by gularohumeral suture.
      - a.—Alveolar surface of upper jaw without a longitudinal, median ridge.
        - (1)—Top of head covered posteriorly with smooth, undivided skin; alveolar surfaces of jaws narrow. . . . . *CLEMMYS*.
        - (2)—Top of head covered posteriorly with small shields or granular skin; alveolar surfaces of jaws broad. . . . . *GEOCLEMYS*.
      - b.—Alveolar surface of upper jaw with a longitudinal, median ridge; top of head covered posteriorly with undivided skin; sides of head with numerous, narrow, longitudinal, yellow stripes. . . . . *OCADIA*.
    - 2.—Entoplastron not intersected by gularohumeral suture; entoplastron broader than long. . . . . *PSEUDOCADIA*.
- II.—Limbs more or less cylindrical, the posterior pair club-shaped; digits not webbed; top of head covered anteriorly with shields; costal plates wedge-shaped with alternating broad and narrow ends. . . . . *TESTUDO*.

**CYCLEMYS**

- I.—Carapace strongly tricarinate, flattened between the lateral keels, posterior margin serrated. . . . . *mouhotii*.
- II.—Carapace not or only feebly tricarinate, not flattened middorsally, posterior margin not serrated.
  - A.—Plastron rounded or feebly nicked posteriorly. . . . . *f. sinensis*.
  - B.—Plastron distinctly notched posteriorly.
    - 1.—Top of head largely light yellow; plastron black with narrow, yellow margins. . . . . *trifasciata*.

- 2.—Top of head dark olive margined with yellow; plastron dull yellow save for a large reddish blotch in each shield. . . . . *yunnanensis*.

#### CLEMMYS

- I.—Plastron emarginate posteriorly; top of head with one or two pairs of ocelli situated posteriorly; shell with more or less widely distributed vermiculations, small spots or short streaks.

A.—Save for ocelli, top of head uniform olive or chocolate brown.

*quadriocellata*.

B.—Save for ocelli, top of head grayish olive with black vermiculations.

*bealei*.

- II.—Plastron deeply notched posteriorly; top of head without ocelli; shell without vermiculations, small spots or short streaks.

A.—Chin and throat uniform light yellow. . . . . *mutica*.

B.—Chin and throat yellow with conspicuous black markings and mottling. . . . . *nigricans*.

#### GEOCLEMYS

- I.—Carapace tricarinate. . . . . *reevesii*.

- II.—Carapace unicarinate. . . . . *kwangtungensis*.

#### TRIONYCHIDAE

- I.—Orbit nearer to temporal than to nasal fossa; postorbital arch narrower than diameter of orbit; proboscis as long as diameter of orbit. . . . . *AMYDA*.

- II.—Orbit nearer to nasal than to temporal fossa; postorbital arch somewhat broader than diameter of orbit; proboscis very short, not more than half as long as diameter of orbit. . . . . *PELOCHELYS*.

#### AMYDA

- I.—Dorsal disc bordered anteriorly by a row of large tubercles; a conspicuous patch of tubercles on either side of base of neck. . . . . *steindachneri*.

- II.—Dorsal disc not bordered anteriorly by a row of large tubercles; no conspicuous patch of tubercles on either side of base of neck. . . . . *sinensis*.

#### SERPENTES

- I.—No teeth in upper jaw; body covered above and below with nearly uniform, cycloid scales; tail not laterally compressed.

#### TYPHLOPIDAE.

- II.—Teeth present in both jaws.

A.—Maxillary horizontal, not erectile; fangs, if present, short.

1.—Mental groove present.

a.—Maxillary bearing several teeth which are never preceded by fangs.

(1)—Vestiges of hind limbs usually evident as a clawlike spur on either side of belly opposite vent; top of head cov-

ered by numerous, small, irregular scales.....BOIDAE.

(2)—No vestiges of hind limbs; top of head covered by a few large regular shields.

a'.—Frontal in contact with a large, azygous occipital shield; scales in 15 rows throughout.

XENOPELTIDAE.

b'.—Frontal in contact with a pair of symmetrical, broadly contiguous parietals.....COLUBRIDAE.

b.—Maxillary always bearing fangs which are never preceded by other teeth.

(1)—Tail round.....ELAPIDAE.

(2)—Tail laterally compressed.

HYDROPHIIDAE.

2.—No mental groove; scales in 15 rows throughout.

AMBLYCEPHALIDAE.

B.—Maxillary short, vertically erectile, bearing only long, perforated fangs.

1.—No loreal pit.....VIPERIDAE.

2.—Loreal pit present.....CROTALIDAE.

**BOIDAE**

I.—Premaxillary toothed; labial pits present.....PYTHON.

II.—Premaxillary toothless; no labial pits.....ERYX.

**COLUBRIDAE**

I.—Maxillary teeth not grooved.....COLUBRINAE.

II.—Posterior maxillary teeth grooved.

A.—Nostrils valvular and superior; aquatic.....HOMALOPSINAE.

B.—Nostrils lateral; terrestrial or arboreal.....BOIGINAE.

## Colubrinae

- I.—Snout produced into a pointed appendage covered with small scales. . . . . RHYNCHOPHIS.  
 II.—Snout not produced into a pointed appendage covered with small scales.
- A.—Subcaudals entire; postoculars absent. . . . . ACHALINUS.  
 B.—Subcaudals divided; postoculars present.
- 1.—Temporals and internasals absent. . . . . CALAMARIA.  
 2.—Temporals present; internasals normally absent only in *Oligodon eberhardi*. . . . . ZAOOYS.  
 a.—Scales in an even number of rows. . . . . PTYAS.  
 b.—Scales in an odd number of rows (except posteriorly in *Ptyas mucosus*). . . . . DENDROPHIS.  
 (1)—Two or more loreals present. . . . . RHADOPIS.  
 (2)—Loreal single, sometimes absent. . . . . OPISOTROPIS.  
 a'.—Mid-dorsal scale row enlarged. . . . .  
 b'.—Mid-dorsal scale row not enlarged. . . . .  
 a''.—Prefrontal entire. . . . .  
 (a)—A single internasal. . . . .  
 (b)—Two internasals. . . . .  
 b''.—Prefrontal divided. . . . .
- (a)—Rostral prominent, the part visible from above generally as great as or greater than its distance from frontal; scales smooth, in 13-19 rows anteriorly, 13-17 posteriorly. . . . . OLIGODON.  
 (a')—Anal divided; scales in 13-15 rows at mid-body. . . . . HOLARCHUS.  
 (b')—Anal entire. . . . .  
 (b)—Rostral not prominent, the part visible from above less than its distance from frontal. . . . .  
 (a')—Maxillary teeth 36 or more in number, uniform in size; scales smooth, normally in 17 rows throughout. . . . . SIBYNOPHIS.  
 (b')—Maxillary teeth 37 or fewer in number.  
 (a'')—Temporals heavily keeled; scales in 23-25 rows at mid-body, all rows keeled. . . . . MACROPISTHODON.  
 (b'')—Temporals not keeled.  
 aa.—Maxillary with one or two toothless spaces, the teeth immediately anterior to the first or only space much larger than those just posterior to it.  
 aa'.—Posterior group of maxillary teeth with three teeth. . . . . DINODON.  
 bb'.—Posterior group of maxillary teeth with two teeth. . . . . LYXODON.

anterior; scales smooth, in 17 rows anteriorly, 15 before vent. a conspicuous, black-edged, yellow, mid-dorsal stripe extending from frontal throughout length of body. . . . COLUBER.

(bb')—Posterior maxillary teeth not longer than anterior; no black-edged, mid-dorsal stripe extending from frontal throughout length of body.

(aa'')—Maxillary teeth 9; scales smooth, in 19 rows; ventrals 229, subcaudals 51.

CORONELLA.

(bb'')—More than 9 maxillary teeth.

ELAPHE.

bb.—Maxillary without a toothless space preceded by teeth larger than those following it.

aa'.—Scales oblique anteriorly; hemipenis deeply forked.

aa''.—Last two maxillary teeth greatly enlarged; scales keeled, in 17-19 rows at mid-body, 15 before vent; anal divided. PSEUDOXENODON.

bb''.—Last two maxillary teeth not enlarged; scales in 15 rows throughout; anal entire. . . . . TRIRHINOPHOLIS.

bb'.—Scales not oblique anteriorly.

aa''.—Hypophyses developed throughout vertebral column.<sup>1</sup>

(aa)—A pair of prefrontals and internasals always present; rarely more than 19 rows of scales present anteriorly or fewer than 17 posteriorly. . . . . NATRIX.

(bb)—Either or both internasal and prefrontal divided into more than two scales. . . . . HELICOPS.

bb''.—Hypophyses present only on anterior vertebrae.

(aa)—Scales in 15 rows throughout; body green above and below or green with narrow, dorsal cross-bands present posteriorly. . . . . EURYPHOLIS.

(bb)—Scales in more than 15 rows anteriorly.

(aa')—Posterior maxillary teeth longer than

<sup>1</sup>If this character presents difficulties, a study of the remainder of the key will show that a specimen may be carried to its proper genus by a process of elimination, without determining whether or not it has hypophyses developed posteriorly. In this connection, compare the 10th row count of Chinese *Natrix*, as indicated in the present key, with those of *Elaphe* (p. 24). It should be evident that scale formulas alone will almost invariably suffice to place a snake in one of these two genera. Geographic probability often serves to carry one over a puzzling section of a key.

## SIBYNOPHIS

- I.—Ten upper labials, only the very large eighth in contact with the single anterior temporal. . . . . *collaris*.
- II.—Nine upper labials, eighth not very large; two anterior temporals, the lower larger and in contact with the seventh and eighth upper labials, seldom entering labial margin (rarely eight upper labials, the sixth and seventh in contact with the lower anterior temporal).
- A.—Subcaudals 83. . . . . *grahami*.
- B.—Subcaudals 98 or more. . . . . *chinensis*.

## NATRIX

- I.—A conspicuous, light, black-edged, vertical bar extending upward from the mouth immediately behind the eye and another similar one just anterior to the eye; subcaudals 116-121; body and tail long and slender, devoid of encircling bands of color; more than 40 maxillary teeth. . . . . *ornaticeps*.
- II.—Eye not preceded and followed by light, black-edged bars; not more than 100 subcaudals; fewer than 40 maxillary teeth.
- A.—Conspicuous bands usually completely encircling the body, sometimes indistinct or wanting dorsally (and ventrally as well in *percarinata*).
- 1.—Normally not more than one labial entering the eye, all rarely excluded from it by suboculars; maxillary teeth 23-28.
- a.—Bands encircling body 16-21, those on tail 7-12, the former constricted on the flanks and usually double on the back and belly (not double in very young individuals); belly devoid of red; head long, its sides viewed from above nearly straight; labials rarely excluded from eye. . . . . *aequifasciata*.
- b.—Bands encircling body very numerous, more than 30 on body and 14 on tail; belly red between the cross-bands; head moderately long, its sides viewed from above distinctly convex; all labials never excluded from eye. . . . . *annularis*.
- 2.—Two labials entering the eye; no red on belly; body bands, if distinct, at least 30 in number; maxillary teeth 29-32. . . . . *percarinata*.
- B.—Body not encircled by bands.
- 1.—Nuchal groove more or less developed.
- a.—Nuchal groove always well developed; upper labials six or fewer; a single anterior temporal. . . . . *nuchalis*.
- b.—Nuchal groove sometimes only poorly developed; upper labials eight or nine, rarely seven; two anterior temporals. . . . . *subminiata*.
- 2.—Nuchal groove absent (sometimes rudimentary in *tigrina lateralis*).
- a.—A conspicuous, divided or simple, black nuchal bar followed for a considerable distance by black cross-bars or checker spots separated by red interspaces; body otherwise predominantly green, belly green and black; two pre-oculars. . . . . *tigrina lateralis*.

b.—Neck and anterior part of body devoid of conspicuous, black cross-bands or checker spots separated by red interspaces; body nowhere predominantly green.

(1)—Dorsum distinctly lineate throughout, devoid of cross-bars and checkering.

a'.—Scales strongly keeled and distinctly notched at their posterior extremities. . . . *bitaeniata*.

b'.—Scales not strongly keeled, not or scarcely notched at their posterior extremities.

*octolineata*.

(2)—Pattern not distinctly lineate throughout.

a'.—A conspicuous lateral line along the belly formed by a black spot on the end of each ventral; belly immaculate between this line and its fellow; dorsum with no pattern or only a faint one; a whitish area on either side of the neck variable in size and shape, sometimes part of a light, longitudinal stripe and often inconspicuous (in *chrysarga*, lateral, ventral spots may be present but they are seldom evident anteriorly and the belly is often pigmented between them; the dorsum always has a double row of conspicuous, light spots; a light marking, usually in the form of a V with the apex directed posteriorly, is present on the neck).

a''.—Ventrals 165-175; subcaudals 85-91.

*johannis*.

b''.—Ventrals 157 or fewer.

(a)—Ventrals 138 or more; scales 19-17; five, rarely six lower labials in contact with anterior chin-shields.

*craspedogaster*.

(b)—Ventrals 140 or fewer.

(a')—Upper labials seven; scales in 17 rows throughout.

*sauteri*.

(b')—Upper labials eight; scales 19-17; four lower labials in contact with anterior chin-shields. . . . *popei*.

b'.—No lateral line along the belly formed by a black spot on the end of each ventral; a conspicuous dorsal pattern.

a".—Internasals broadly truncate anteriorly; a row of small, whitish spots along either side of the back, more or less connected, or even supplanted anteriorly, by black spots; scales heavily keeled, keels being present even on the outermost rows..... *chrysarga*:

b".—Internasals much narrowed anteriorly; back without whitish spots along either side, or, if present, such spots are boldly connected anteriorly by black cross-bands, and posteriorly coalesce to form a longitudinal stripe: scales keeled, but at least one outermost row smooth.

(a)—Anterior temporals normally single; three upper labials normally entering eye; all but outermost row of scales on either side keeled.

*stolata*.

(b)—Anterior temporals normally two; two upper labials normally entering eye; at least two outermost rows of scales on either side smooth.

*piscator*.

#### **Natrix subminiata**

- I.—Ventrals fewer than 160..... *s. subminiata*.  
 II.—Ventrals 160 or more..... *s. helleri*:

#### **PSEUDOXENODON**

- I.—Light brownish-gray above, body and tail crossed by 15 to 24 conspicuous, black or black and gray bands, the first of which sends a narrow black stripe forward along the neck to the parietals where it joins its fellow of the opposite side.  
*bambusicola*.
- II.—No conspicuous black cross-bands above; no black stripe extending along the neck to join its fellow on the parietals.
- A.—A narrow, mid-dorsal, grayish stripe bordered with black present on the tail and persisting a variable distance anterior to the vent.  
*striaticaudatus* or *dorsalis*.<sup>1</sup>
- B.—No black-bordered, grayish stripe present on tail.
- 1.—Snout crossed immediately anterior to the eyes by a black band.  
*fukienensis*.

<sup>1</sup>*P. dorsalis* is known from a single specimen. The status of the species is problematical and the characters distinguishing it from *striaticaudatus* too complex to be set forth in a key.

2.—Snout not crossed by a black band.

- a.—Maxillary teeth 19-22; pattern more or less infused with yellow; a black nuchal spot pointed anteriorly, forked posteriorly usually evident throughout life. . . . . *macrops*.
- b.—Maxillary teeth 26 or 27; pattern devoid of yellow; a black, anteriorly pointed, posteriorly forked nuchal spot evident only in the young. . . . . *karlschmidti*.

**Pseudozenodon karlschmidti**

- I.—Ventrals 154 or fewer. . . . . *k. karlschmidti*.
- II.—Ventrals 153 or more. . . . . *k. sinii*.

**Pseudozenodon macrops**

- I.—Upper labials eight, rarely seven; ventrals rarely as few as 162. . . . . *m. macrops*.
- II.—Upper labials seven, rarely eight; ventrals 162 or fewer. . . . . *m. sinensis*.

**OPISTHOTROPIS**

- I.—Upper labials thirteen to sixteen, irregular, many divided horizontally; scales in 19 rows throughout. . . . . *kuatunensis*.
- II.—Upper labials not more than eleven, regular, normally not divided horizontally; scales in not more than 17 rows posteriorly.
  - A.—Scales in 19 rows anteriorly and at mid-body, reduced to 17 posteriorly; body completely encircled by alternate dark and light bands, the former compound dorsally. . . . . *balteata*.
  - B.—Scales nowhere in more than 17 rows; body not banded.
    - 1.—Ten or eleven upper labials. . . . . *lateralis*.
    - 2.—Seven to nine upper labials.
      - a.—Seven upper labials, first directed backward to form a broad contact with the posterior half of the nasal, seventh very long. . . . . *maxwelli*.
      - b.—Eight or nine, rarely seven, upper labials, first vertical, not directed backward, in contact only with anterior part of nasal, last rarely very long.
        - (1)—Nasal divided below nostril; two or three, rarely one, preoculars (including subpreocular) excluding loreal from eye. . . . . *andersonii*.
        - (2)—Nasal never completely divided below nostril; preoculars usually absent, occasionally one, very rarely two present; loreal generally broadly entering eye. . . . . *latouchii*.

**ACHALINUS**

- I.—Suture between internasals longer than that between prefrontals; 23-25 rows of scales at mid-body. . . . . *rufescens*.
- II.—Suture between internasals shorter than that between prefrontals; 21-23 rows of scales at mid-body. . . . . *spinalis*.

**LYCODON**

- I.—Preocular absent, prefrontal entering eye. . . . . *subcinctus*.  
 II.—Preocular present, prefrontal excluded from eye.  
 A.—Loreal in contact with internasals. . . . . *a. aulicus*.  
 B.—Loreal not in contact with internasals.  
 1.—Loreal nearly always entering eye; preocular usually in contact with frontal; body and tail completely encircled throughout by alternate black and white bands. . . . . *fasciatus*.  
 2.—Loreal seldom entering eye; preocular never in contact with frontal; black bands of body nearly always interrupted on ventrals which are largely white (interruption of black bands more complete anteriorly than posteriorly and more evident in adults than in juveniles) . . . . . *ruhstrati*.

**DINODON**

- I.—Blackish above with red cross-bands; loreal extended backward, usually entering eye; scales smooth or with a few mid-dorsal rows weakly keeled posteriorly; usually 12 maxillary teeth. . . . . *rufozonatum*.  
 II.—Blackish above with yellow cross-bands; loreal seldom extended posteriorly, always excluded from eye; 6 to 9 scale rows more or less distinctly keeled at mid-body; 13 maxillary teeth. . . . . *flavozonatum*.

**ZAOCYS**

- I.—Black, longitudinal lines more or less evident throughout length of body. . . . . *dhumnades*.  
 II.—Black, longitudinal lines never present anteriorly, more or less evident posteriorly. . . . . *nigromarginatus*.

**Zaocys dhumnades**

- I.—Subcaudals 124 or fewer. . . . . *d. dhumnades*.  
 II.—Subcaudals usually more, rarely fewer, than 124. . . . . *d. montanus*.

**PTYAS**

- I.—Scales in 21 or 19 rows on the neck, 17 at mid-body and 14 before the vent. . . . . *mucosus*.  
 II.—Scales in 17 or 15 rows on the neck, 15 or 13 at mid-body and 11 before the vent. . . . . *korros*.

**ELAPHE**

- I.—Dorsum uniform bright green with or without indistinct, lateral, oblique, black lines, or, if not green (juvenile *frenata*), loreal absent; complete scale formula 19-17-15.  
 A.—Loreal present. . . . . *prasina*.  
 B.—Loreal absent. . . . . *frenata*.  
 II.—Dorsum not bright green; loreal present (small, rarely absent, in *mandarinus*); scales in 17 or more rows just before vent.  
 A.—Scales in 19 or 21 rows at and anterior to mid-body, 17 just before vent.

- 1.—Scales smooth; ventrals fewer than 220.
  - a.—Scales in 19 rows at and anterior to mid-body; belly immaculate. . . . . *porphyracea*.
  - b.—Scales in 21 rows at and anterior to mid-body; belly conspicuously spotted with black. . . . . *rufodorsata*.
- 2.—Scales keeled; ventrals more than 220.
  - a.—Anal entire; eight or nine upper labials. . . . . *radiata*.
  - b.—Anal divided; seven upper labials. . . . . *perlacea*.
- B.—Scales in more than 21 rows either at or anterior to mid-body.
  - 1.—Scales smooth; no subpreocular; dorsum gray, gaudily adorned with numerous, rhomboidal saddles each consisting of a yellow center broadly bordered with black which is in turn narrowly margined with yellow. . . . . *mandarinus*.
  - 2.—Scales keeled, or, if smooth, a subpreocular present; dorsum without conspicuous yellow and black rhomboidal saddles.
    - a.—One or two outer scale rows smooth at mid-body, the others strongly keeled.
      - (1)—More than 200 ventrals. . . . . *carinata*.
      - (2)—Fewer than 200 ventrals. . . . . *dauidi*.
    - b.—More than two outer scale rows smooth at mid-body, keels, when present, not strongly developed.
      - (1)—Tail with four black and four white longitudinal stripes, one white one mid-dorsal, another mid-ventral. . . . . *taeniurus*.
      - (2)—Tail without four black and four white stripes.
        - a'.—More than 250 ventrals. . . . . *moellendorffi*.
        - b'.—Fewer than 250 ventrals.
          - a''.—Pattern complex in young, rapidly fading with maturity: entirely or almost entirely disappearing anteriorly and reduced to indistinct, double, black blotches posteriorly; postocular stripe solid black in young. . . . . *schrenckii anomala*.
          - b''.—Pattern complex, not changing noticeably with age, always uniform throughout length of body; postocular stripe olive gray with black margins.
            - (a)—Lower labials eight to ten, rarely eleven; both branches of posterior head pattern extending caudad a short distance along neck as two parallel, black-edged stripes; a double row of circular spots along middle of back often connected to form a dumb-

bell pattern; maxillary teeth  
18-20 . . . . . *bimaculata*.

- (b)—Lower labials eleven to thirteen, very rarely ten; posterior head pattern ending abruptly on the occiput as two broad, divergent, black-edged spots; middle of back with numerous, narrow, black cross-bands never more than remotely suggesting a dumb-bell pattern; maxillary teeth 15-17.

*dione*.

### Elaphe porphyracea

- I.—Longitudinal black lines absent or fragmentary anteriorly . . . . . *p. porphyracea*.  
II.—Longitudinal black lines complete or nearly complete throughout.  
*p. nigrofasciata*.

### EURYPHOLIS

- I.—Anal entire; dorsum uniform green . . . . . *doriae*.  
II.—Anal divided.  
A.—Dorsum uniform light green . . . . . *major*.  
B.—Dorsum olive green crossed by numerous narrow, bichromatic bands posteriorly . . . . . *multicinctus*.

### HOLARCHUS

- I.—Scales in 19 rows anteriorly . . . . . *formosanus*.  
II.—Scales in 17, rarely 15, rows anteriorly.  
A.—Ventrum with a double row of distinct black spots; a conspicuous design on head and neck . . . . . *chinensis*.  
B.—Ventrum without black spots; head and neck without design . . . *violaceus*.

### OLIGODON

- I.—Internasals absent; scales in 13 rows at mid-body . . . . . *eberhardti*.  
II.—Internasals normally present; scales in 15 rows at mid-body . . . *ornatus musyi*.

### CALAMARIA

- I.—Frontal longer than broad; tail tapering to a point . . . . . *p. pavimentata*.  
II.—Frontal as long as broad; tail blunt . . . . . *septentrionalis*.

### ENHYDRIS

- I.—Scales in 19 rows at mid-body; two upper labials entering eye . . . . . *plumbea*.  
II.—Scales in 21-25 rows at mid-body (very rarely 19 in *enhydris*); a single upper labial entering eye.  
A.—Scales in 23 or 25 rows at mid-body . . . . . *chinensis*.  
B.—Scales in 21 rows at mid-body (rarely 23 in *enhydris*).

- 1.—Dorsum grayish olive with two rows of irregular, black spots which may be more or less transversely or longitudinally connected. *bennettii*.
- 2.—Dorsum uniform grayish olive or grayish brown with or without two light longitudinal lines. . . . . *enhydriis*.

**Boiginae**

- I.—One or more of the middle ungrooved maxillary teeth much enlarged.
  - A.—Scales oblique, mid-dorsal row enlarged; pupil horizontal. . *Ahaetulla*.
  - B.—Scales not oblique, mid-dorsal row not enlarged.
    - 1.—Anal entire; pupil vertically elliptic. . . . . *Psammodynastes*.
    - 2.—Anal divided; pupil round. . . . . *Taphrometopon*.
- II.—None of the middle ungrooved maxillary teeth enlarged.
  - A.—Pupil vertically elliptic; head very distinct from neck. . . . . *Boiga*.
  - B.—Pupil round; head moderately distinct from neck. . . . . *Chrysopelea*.

**BOIGA**

- I.—Temporals not differentiated, their place occupied by numerous small scales; vertebral scale row not enlarged; anal divided. . . . . *kraepelini*.
- II.—Temporals well developed, one to three in anterior row; vertebral scale row enlarged; anal entire. . . . . *multomaculata*.

**ELAPIDAE**

- I.—Mid-dorsal scale row enlarged; subcaudals undivided. . . . . BUNGARUS.
- II.—Mid-dorsal scale row not enlarged; all or most of the subcaudals divided.
  - A.—Neck dilatable, surrounded by more scale rows than mid-body; internasal bordering nostril. . . . . NAJA.
  - B.—Neck not dilatable, not surrounded by more scale rows than mid-body; internasal not bordering nostril.
    - 1.—Fangs followed by one or more small teeth; scales in 15 rows throughout. . . . . HEMIBUNGARUS.
    - 2.—Fangs not followed by small teeth; scales in 13 rows throughout. . . . . CALLIOPHIS.

**BUNGARUS**

- I.—Pattern of black and yellow bands, all of which completely encircle the body; tail blunt. . . . . *fasciatus*.
- II.—Pattern of black and white bands, the former interrupted on the belly; tail tapering to a point. . . . . *multicinctus*.

**Bungarus multicinctus**

- I.—Light bands on body 31 or more. . . . . *m. multicinctus*.
- II.—Light bands on body 31 or fewer. . . . . *m. wanghaotingi*.

**NAJA**

- I.—An enlarged pair of contiguous occipital shields; scales in 15 rows at mid-body. *hannah*.
- II.—No enlarged contiguous occipital shields; scales in 21 (rarely 19) rows at mid-body. . . . . *naja atra*.

**HYDROPHIIDAE**

- I.—Ventrals small but distinct throughout, not divided by a median suture.
- A.—Maxillary with 5 teeth in addition to fangs; ventrals broad anteriorly, narrow posteriorly. . . . . THALASSOPHINA.
- B.—Maxillary with 6-18 teeth in addition to fangs; ventrals uniform in width. . . . . HYDROPHIS.
- II.—Ventrals much reduced in size or absent or divided by a median suture.
- A.—Maxillary with 8-10 teeth in addition to fangs. . . . . PELAMYDRUS.
- B.—Maxillary with 3-6 teeth in addition to fangs.
- 1.—Body excessively slender anteriorly; ventrals divided by a median suture. . . . . MICROCEPHALOPHIS.
- 2.—Body not excessively slender anteriorly; ventrals small or absent, never divided by a median suture. . . . . LAPEMIS.

**HYDROPHIS**

- I.—Ten to 18 maxillary teeth in addition to fangs.
- A.—Ten to 13 maxillary teeth in addition to fangs. . . . . *o. ornatus*.
- B.—Fourteen to 18 maxillary teeth in addition to fangs. . . . . *caerulescens*.
- II.—Five to 8 maxillary teeth in addition to fangs.
- A.—Body slender anteriorly; normally a single, large anterior temporal. . . . . *melanocephalus*.
- B.—Body not slender anteriorly; two superimposed anterior temporals. . . . . *cyanocinctus*.

**AMBLYCEPHALUS**

- I.—Loreal broadly entering eye; preocular absent.
- A.—Ventrals 175-189; subcaudals 63-69; upper labials eight; scales smooth. . . . . *boulengeri*.
- B.—Ventrals 151-160; subcaudals 48-60; seven or eight upper labials; mid-dorsal scales keeled. . . . . *stanleyi*.
- II.—Loreal excluded from or barely entering eye; preocular present.
- A.—Uniform dark grayish-brown above, a few black scales with white proximal tips scattered along the dorsum, these scales sometimes more or less regularly disposed to form narrow cross-bands; top of head devoid of pattern. . . . . *moellendorffi*.
- B.—Light tawny brown above with numerous, irregular black spots or cross-bands which may (in *niger*) be predominant; head tawny brown with a black or blackish pattern (quite black in *niger*).
- 1.—Predominantly black above; head black, without pattern; ventrals 165; subcaudals 64. . . . . *niger*.
- 2.—Predominantly light tawny brown above; head tawny brown with a black or blackish pattern; more than 165 ventrals.
- a.—Tip of loreal entering eye; ventrals 171-176; scales keeled. . . . . *yunnanensis*.
- b.—Loreal excluded from eye (or occasionally entering it in *chinensis*); ventrals 175-194; scales smooth (sometimes weakly keeled in *chinensis*).
- (1)—Seven to 9 maxillary teeth. . . . . *tonkinensis*.

(2)—Four to 6 maxillary teeth.

a'.—Ventrals 175-180; subcaudals 60-74.

*chinensis.*

b'.—Ventrals 180-194; subcaudals 72-93.

*kuangtungensis.*

**VIPERIDAE**

I.—Head covered above with a few large, paired shields; scales of body smooth, in 17 rows . . . . . AZEMIOPS.

II.—Head covered above with numerous, small scales; scales of body keeled, in more than 17 rows . . . . . VIPERA.

**CROTALIDAE**

I.—Head covered above with a few large, paired shields . . . . . AGKISTRODON.

II.—Head covered above with numerous, small scales . . . . . TRIMERESURUS.

**AGKISTRODON**

I.—Internasals and rostral produced to form a short, upturned appendage. . . *acutus.*

II.—Internasals and rostral normal.

A.—Scales in 21 or more rows at mid-body.

1.—Internasals broader than long, often bandlike; a yellowish stripe beginning on the uppermost postocular and extending rearward nearly always present . . . . . *halys.*

2.—Internasals longer than or as long as broad, never bandlike; no yellowish stripe extending rearward from uppermost postocular. . . . . *strauchi.*

B.—Scales in 19 rows at mid-body; no yellowish stripe extending rearward from uppermost postocular . . . . . *monticola.*

**TRIMERESURUS**

I.—First upper labial partly (rarely not) separated from nasal by a suture; green (rarely with indistinct blackish cross-bands) above, upper lip and belly yellowish or greenish. . . . . *albolabris.*

II.—First upper labial completely separated from nasal by a suture.

A.—No scales present between nasal and scale forming anterior border of pit; scales in 23-25 rows at mid-body . . . . . *monticola.*

B.—One or more small scales present (rarely absent in *jerdonii* and *stejnegeri*) between nasal and scale forming anterior border of pit; scales in 19-29 rows at mid-body.

1.—Scales in 25-29 rows at mid-body; more than 190 ventrals.

*mucrosquamatus.*

2.—Scales in 19 or 21 (23) rows at mid-body; fewer than 190 ventrals.

a.—Uniform green above and below save for a narrow stripe along either side of the belly. . . . . *stejnegeri.*

b.—An intricate pattern chiefly composed of greenish yellow and black . . . . . *jerdonii.*

**Trimeresurus stejnegeri**

I.—Scales in 21 rows at mid-body . . . . . *s. stejnegeri.*

II.—Scales in 19, rarely 21, rows at mid-body . . . . . *s. yunnanensis.*





