The Occurrence and Taxonomy of Mango Leafhoppers in Thailand

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Abstract

Seven species of leafhoppers occurring on mango in Thailand were studied. A new species, *Idioscopus chumphoni* Hongsaprug from Southern Thailand is described and illustrated. Four species namely, *Idioscopus nagpurensis* (Pruthi), *I. clavosignatus* Maldonado – Capriles, *Amrasca splendens* Ghauri and *Mangganeura reticulata* Ghauri are newly recorded. Two species, major pests of mango, formerly known as *Idiocerus clypealis* Lethierry and *Idiocerus niveosparsus* Lethierry are corrected to the proper genus of *Idioscopus* Baker.

Keywords : mango leafhoppers, *Idioscopus chumphoni, I. clypealis I. nagpurensis, I. niveosparsus I. clavosignatus, Amrasca splendens, Mangganeura reticulata*

Mango leafhoppers are of economic importance. The insect effects the mango in four ways. Firstly, it sucks sap from young leaves, causing leaves to curl (Figure 1) and not produce flowers. Secondly, it sucks sap from the flower stalk, causing the flower to dry up and eventually to fall or fruit deformity. Thirdly, piercing opens the way for various types of harmful fungi which attack the young fruit and cause it to rot or, in severe cases to drop off, Fourthly, because the insect sucks sap from the tree through the young leaves and flowers, the tree itself is weakened.

Before this study, *Idiocerus clypealis* (Leth.) and *I. niveosparsus* (Leth.) were the only two species of leafhoppers known from Thailand as important pests of mango. Until October 1980, numerous specimens of *Amrasca splendens* Ghauri on young mango leaves were collected from Bangkla, Chachoengsao province, Central Thailand. This was the first record of this species from Thailand.

A year later, several mango trees in flowering stage in different parts of the country were surveyed. Another species of Typhlocybine leafhopper, *Mangganeura reticulata Ghauri* was found for the first time in Chumphon province, Southern Thailand (Hongsaprug, 1984).

In 1983, the author made a taxonomic study on leafhoppers of the genus *Idioscopus* from Thailand. In which 5 species, including a new species, *Idioscopus chumphoni* Hongsaprug have been found attacking mango in Chumphon province. (Figure 9)

Materials and Methods

Figure 1. Symptoms of shoot with curl leaves caused by sucking of leafhoppers.

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The mango leafhopper specimens were mounted by attaching the side of thorax to a card point. The abdomen was removed, and cleared in 10% KOH overnight. The contents were carefully cleaned in distilled water without damaging the genital capsule. The genitalia were stored in vials on the pin of the mounted specimens.

Drawing were made by using a camera lucida attachment to a compound microscope.

Results and Discussion

Seven species of leafhoppers were found attacking mango in Thailand as follow :

Subfamily Typhlocybinae

1. *Amrasca splendens* Ghauri, new record, from Chachoengsao province.

2. *Mangganeura reticulata* Ghauri, new record, from Chumphon province.

Subfamily Idiocerinae

3. *Idioscopus clypealis* (Leth.) widely distributed in Oriental region. (Hongsaprug, 1984)

4. *I. nagpurensis* (Pruthi), new record, from Thailand and widely distributed.

5. *I. clavosignatus* Maldonado, new record, from Chumphon province.

6. *I. niveosparsus* (Leth.), widely distributed.

7. *I. chumphoni* Hongsaprug sp. nov. from Chumphon province.

Subfamily Typhlocybinae

***Amrasca splendens* Ghauri** (Figure 2)

(Pl. 1.; Figures a – g)

Figure 2. ***Amrasca splendens*** **Ghauri feeds on (sucks sap from) young leaves.**

***Amrasca splendens* Ghauri, 1967 : Proc. R. ent Sic. Lond (B) 36(11 – 12) pp. 159 – 166.**

A delicate and beautiful coloured species; resembles *Amrasca biguttula biguttula* (Ishida) *(Empoasca devastans* Distant) from which it differs by its less density setose subgenital plates, and its markings on head, thorax and wings.

Colouration : General body colour greenish lemon – yellow with redish brown and dark brown markings on head, thorax and tegmina; head, vertex basal half dark brown, apical half yellow with 2 round dark spots, eyes dark brown; ocelli colorless; frons (Pl.1; Figure b) basal half with light red suffusion interrupted by a central and lateralwedge – shaped yellow streaks, in addition a wedge – shaped area around ocellus along internal margin of eye yellow. apical part of frons yellow; clypellus with greenish tinge; pronotum (P1.1; Figure a) mostly redish brown, with a total of 6 brown spots; area around latero – anterior corners and a pear shaped spot on median line near anterior margin yellow; scutellum (P1.1; Figure a) mostly redish brown, rest of lateral margin yellow with redish suffusion elongate spots along the marginal area and one spot on median line yellow; tegmina greenish yellow, translucent with a large spot in the apex of cubital cell, a second slightly smaller spot in the base of first apical cell and a third even smaller spot in the apex of cell M, black; wings whitish – green. (P1.1; Figure d – e)

Size total body length male 2.41, female 2.45 mm

Male genitalia as in Pl.1 Figures f and g.

This species was collected for the first time on young mango leaves from Chachoengsao province and Bangkok, Central Thailand.

Material examined thirty males and ten females from Chachoengsao province, (Figure 9) Central Thailand, Oct. 23, 1983, by Y. Tevahaskulthong.

***Mangganeura reticulata* Ghauri** (Figure 3)
(Pl.2; Figures a – l)

Figure 3 *Mangganeura reticulata* Ghauri.

***Mangganeura reticulata* Ghauri, 1967 : Proc. Royal Ent. Soc. Lond (B) 36(11 – 12) pp.159 – 166.**

***Mangganeura reticulata* Ghauri & Hongsaprug & Wilson, 1985 : Jour. Nat. Hist. Vol.19 : 173 – 183.**

Colouration : Male face centrally, and vertex yellow. Outer part of genae and border of terminal portions of lateral frontal suture (visible on vertex) with prominent reticulated pattern (Pl.2; Figure a). Clypellus blackish except at margins, blackish streak continued towards frons (Pl.2; Figure b). Antennae ochre – yellow. Scutum and scutellum yellowish to whitish. Eyes and large basal triangle black. Tegmina slightly olive – yellow on clavus and wax field remaining parts of membrance semi – transparent, sordid whitish with indistinct semi – transparent, sordid whitish with indistinct brownish suffusion at least inside 3 rd apical cell. Vein yellowish – beige. Legs pale yellow. Abdomen blackish with pale margins to sclerite. Female colouration as male, except the infuscation of the forewing usually more distinct (Pl.2; Figure k). Abdominal sclerites blackish – brown, pygofer and valvae of the same colour, with pale setae on pygofer, 7th sternite light beige infuscated centrally in the caudal portion (P1.2;Figures i and j).

Male genitalia : (P1.2; Figures d – h). Aedeagus shaft short, straight, slightly broaden terminally, without any process at apex. Male abdominal apodemes similar to those in *Bakera* S.S.

Female genitalia : 7 th sternite with hind part tapering and rounded apically (Pl.2; Figures i and j).

Length : male 4.4 – 4.7 mm, female 4.5 – 4.7 mm

Material studied : 10 ♂♂ and 7 ♀♀ from Chumphon province southern Thailand. R Thawarnwongs Coll.

Comment. This species was described by Ghauri (1967) from male specimens only. This record not only included females in the series, but confirms the host plant as mongo. So far, this species has not been found from any other provinces of Thailand.

Subfamily Idiocerinae.

***Idioscopus clypealis* (Lethierry)** (Figure 4)
(Pl.3; Figures a – f)

Figure 4. *Idioscopus clypealis* (Lethirerry)

***Idiocerus clypealis* Lethierry, Distant, 1908. Fauna British India, Vol. IV : 187.**

***Idioscopus clypealis* (Lethierry), Maldonado, 1964. Proc. Ent. Soc. Wash. Vol. 66, No.2 : 92 – 93.**

Head, pronotum and scutellum flavescent; vertex short about one third as long as pronotum; finely transverse corrugated, two black spots on anterior margin of vertex of female, but not present in male (P1.3; Figures a and b). Eyes extending well beyond lateral

margin of pronotum. Frons immacuate, from crown to near ocelli very finely transverse corrugated, remaining portion of face shagreened, two black spots on fronto-clypeus mesad and basad of ocelli, clypellus completely black (Pl.3; Figure c). Pronotum shagreened, almost tree time as wide as long, scutellum yellowish with a triangular black spot near each basal angle; tegmina very pale ochraceous, the vein concolorous, the posterior costal area broadly hyaline; body beneath and legs pale yellow.

Structure of male genitalia as in Pl.3; Figures d – f. Material examined from Roi – Et province, Bangkok and Chiangmai. (Figure 9)

Size; male 3.70 – 4.20 mm, female 3.8 – 4.1 mm.

Comment. This species is widely distributed in Thailand and known as major pest of mango (Hongsaprug, 1984).

Idioscopus nagpurensis (Pruthi) (Figure 5)

(Pl.3; Figures g – j)

Figure 5 *Idioscopus nagpurensis* (Pruthi)

***Idiocerus nagpurensis* Pruthi, 1930 : Mem. Ind. Mus., 11 : 1 – 68.**

***Idioscopus clypealis* : auct., see *Idiocerus clypealis* Lethierry 1889.**

Head, pronotum and scutellum flavescent; vertex with two black spots closer to eyes than to the coronal suture. The spots bigger in female than in male (Pl.3; Figure g) but distinct in both sexes. Face brownish testaceous above, slightly ochraceous below centrally, ocelli greyish brown, two rather big spots on the median black, clypellus never entirely black, only apical half or $\frac{2}{3}$ of clypellus blackish brown (Pl.3; Figure i). Pronotum light brownish testaceous. Scutum and scutellum yellowish with basal triangles black, and often wide brownish infuscation along midline on scutum. Center of 8 th sternite of male broadly dark brown paler to sides. Seventh abdominal sternite of female usually dark brown, valvae blackish. Tegmina testaceous with a brown at the base and broad infuscation at costal margin basally. Inner and hind margin of clavus marked with brown.

Male genitalia similar to those of *I. clypealis* (Leth.) but apodeme almost straight in its apical part and bluntly terminated (P1.3; Figure j). and portion of longer and shorter branches of aedeagus processes different. Aedeagus proces broader in *I. clypealis* but serrated very similar (Pl.3; Figures f and j).

Comment. This species is also a new record from Thailand, and widely distributed in all regions of Thailand, and most often confused with *I. clypealis* (Leth.) but differs in marking on clypellus as mentioned above. (Hongsaprug, 1984)

Idioscopus clavosignatus Maldonado (Figure 6)

(P1.1; Figures h – k)

Figure 6. *Idioscopus clavasignatus* Maldonado Capriles

***Idioscopus clavosignatus* Maldonado, 1974 : Zoologische Mededelingen 48(15) : 163 – 167.**

Vertex anteriorly, anterior part and sides of pronotum, scutum and anterior part and very apex of scutellum black; remaining parts of pronotum dark brown. Base of vertex and bordering of coronal suture partly brown, partly sordid whitish to ivory. There are three large and four small ivory patches along anterior margin of pronotum. A large heart shaped patch in hind part of scutellum bright yellow (Pl.1; Figure h). Frons mainly black with four whitish patches on a transitional part to vertex and at ocelli. Antennae, transverse patches above their bases, irregularly arcuate patch on frontoclypeus below ocelli, largely margins of lorae and adjacent parts of genae, brown. Sometimes there are additional brown areas at side of face (P1.1; Figure i). Tegmina membrane brown, veins as well as a large streak along costal margin and some smaller areas dark brown to blackish. There are some white parts of veins and a large white area at costal margin situated similarly as in *I. niveosparsus* (Leth.) but smaller in *I. clavosignatus*. Basal half of clavus and a small triangular surface at base of corium bright yellow. Very inner margin of clavus bordering the bright yellow patch dark brown. Appendix with distinct brownish – grey marginal patch which touch submarginal vein of the wing (Pl.1; Figure j).

Male genitalia as in figure (Pl.1; Figure k). Dorsal apodeme of aedeagus as in *I. niveosparsus* (Leth.) preatrium reduced. Shaft resembles that of *I. chumphoni* sp. **nov.** but it is tubular and its bluntly terminated apical extension almost equally broad on whole its length, two pairs of ribbon – like subapical processes arise on a considerable distance from each other. The lower processes usually slightly asymmetrically sinnuated in lateral aspect, strongly arcuate in caudal aspect. The upper processes aristing almost ventrally strongly arcuate in lateral aspect and loop – like in caudal aspect.

Size : Male 4.8 – 5.0 mm, female 4.8 – 5.2 mm.

Material examined 2 ♂♂, 4 ♀♀, Thailand, Chumphon, Sawi Sta., 1983; 1 ♂ 2 ♀♀ Sawi Sta. June 5, 1983 S. Keonabhon; 1 ♂, 4 ♀♀ Sawi Sta. Sep. 7, 1982. R. Tawarnwongs. All specimens collected on mango from Chumphon province.

Comment : So far this species has been found only from Chumphon (Figure 9).

Idioscopus niveosparsus (Lethierry) (Figure 7)

(Pl.4; Figures a – h)

Figure 7. *Idioscopus niveosparsus* (Lethiery)

***Idiocerus niveosparsus* Lethierry, 1889, Indian Mus. Notes I, 1 : 5.**

***Idiocerus niveosparsus* Lethierry. Distant, 1908, Fauna British India IV : 185.**

***Idioscopus niveosparsus* (Lethierry). Maldonado, 1964, Proc, Ent. Soc. Wash., 66 (2) : 89 – 100.**

Vertex short, with the outline mildly curved at sides (P1.4; Figure a), background of head scutum and scutellum brownish with variable blackish and sordid white patches, very finely transversely corrugated. Eyes clearly extending beyond lateral margin of pronotum. Frons very finely corrugated on upper half, remaining portion shagreened, clypeus with upper extremities reaching ocelli, lateral margins curved to base of clypeus,

in male face is usually darker and the black patch often larger than in female, clypellus always darkened subapically (Pl.4; Figure b). The constant and specially important feature of colouration present in both sexes situation of sordid whitish patches on anteocular areas which are of the same colour as light patches around ocelli. Pronotum dull virescent with brownish and yellow spots and markings irregularly distributed all over paler near outer angles. Scutellum pale ochracheous with three basal blackish or dark brown spots, the central transverse, the lateral angular, behind the central two very small spots and a very small spots on each lateral margin; and a similar spot on each lateral margin; sternum transversely spotted with black and the anal segment of that colour; legs ochraceous, apices of the posterior tibiae black; tegmina light brownish subhyaline, the veins ochraceous or piceous; except of some contrasting white parts of veins and almost blackish patch at costal margin. Appendix with distinct brownish – grey marginal ornamental which broadly touches submarginal vein of wing.

Male genitalia as in Pl.4; Figures c – h.

Material examined – from Roi – Et, Bangkok, and Chiangmai in May, 1983.

Idioscopus chumphoni sp. nov. (Figure 8)

(P1.5; Figures a – j)

Figure 8. *Idioscopus chumphoni* Hongsaprug

Description : Outline of vertex slightly curved at sides, thus appeared to be more straight than in *I. niveosparsus* (Leth.). Colouration and its variability very similar to that of *I. niveosparsus* (Leth.). However, the sordid whitish and black pattern less contrastic and the light brown background predominate in colouration. Vertex never whitish – grey as sometimes in the previous species instead it is light brown with more or less numerous sordid whitish patches (Pl.5; Figure a). Frons coloured as in *I. niveosparsus* (Leth.), however, light brown colour predominate and the lighter patches in its upper margin near eyes. Variability of pattern on face as in *I niveosparsus* (Leth.). The constant and specifically important feature in colouration present in both sexes is situation of whitish spots, which are of the same colour as the light patches around ocelli, below ocelli, touching lateral frontoclypeal suture (P1.5; Figures b and c which never occur in *I niveosparsus* (Leth.). Tegmina membrane brownish, slightly darker than in the previous species. Veins dark brown except some white portions which are situated on white parts of membrane as in *I. niveosparsus* (Leth.). An almost black patch at costal margin. Brownish – grey marginal ornamentation on appendix much less expanded toward submarginal vein than in *I. niveosparsus* (Leth.).

Male genitalia as in Pl.5; Figures d – i. Dorsal apodeme of aedeagus narrow in lateral aspect, expanded to side in caudal aspect, praeatrium reduced. Shaft quite broad, slightly compressed laterally, almost straight, gradually narrowing to a bluntly terminated tapering extention. Two pairs of sculptured very thin subapical processes arise on very short distance from each other near apex of the shaft. The shorter processes are 3 – 4 times shorter than the longer ones. The very special character existing only in the new species and absent in any other *Idioscopus* is presence of two short sclerotized teeth on dorsal side at about $\frac{1}{3}$ from apex of the shaft.

Size : Specimens from Thailand, male 4.60 – 5 mm, female 4.80 – 5.20 mm.

Male paratype from Indo – China 4.20 mm. Female paratype from Phnom – Penh 4.35 mm.

Material examined. Holotype male and paratypes 11 ♂♂, 7 ♀♀ , Thailand, Chumphon, Sawi Sta., Mar. 1, 1983. Other paratypes 2 ♂♂ Sawi Sta., June 1, 1983; 1 ♀ Sawi Sta., June 5, 1983; 7 ♂♂ , 4 ♀♀ Sawi Sta., June 20, 1983, all collect on mango by Sompong Keonaborn. Paratype ♂, labelled : Indo – China, R. Vitalis; paratype ♀, Cambodia, Phnon Penh, Apr. 24, 1950 L. Caresche.

The two specimens (1 ♂, 1 ♀) from NE Thailand are shorter thus more robust and paler coloured than those of the remaining part of the type series of *I. chumphoni.* The genital apparatus of the single male is, however, not differing from that the holotype. The types are deposited in the Department of Agriculture Museum, Bangkok; British Museum Natural History U.K.

The name of the new species origin from the name of the late Prince of Chumphon.

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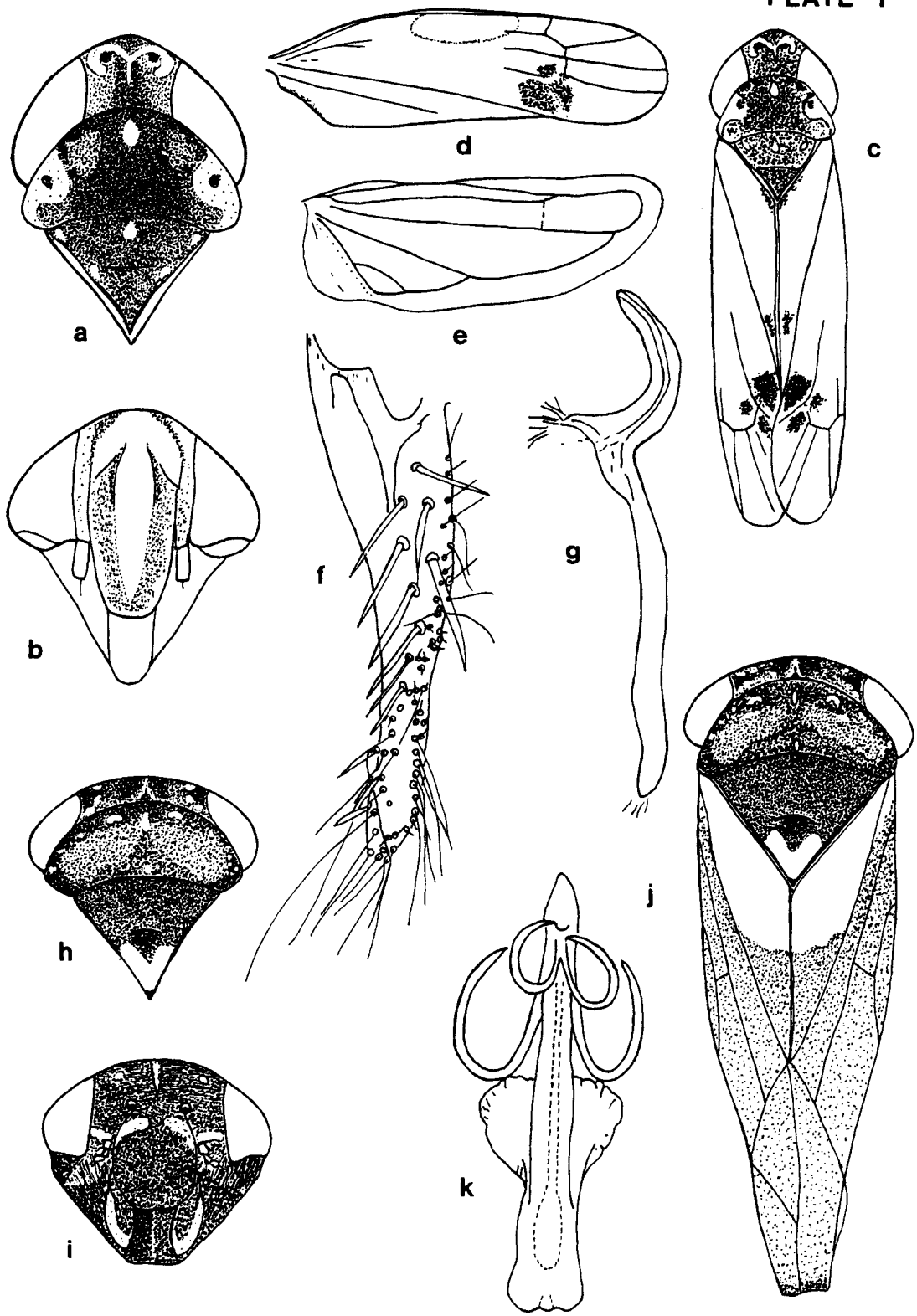
***Amrasca splendens* Ghauri**

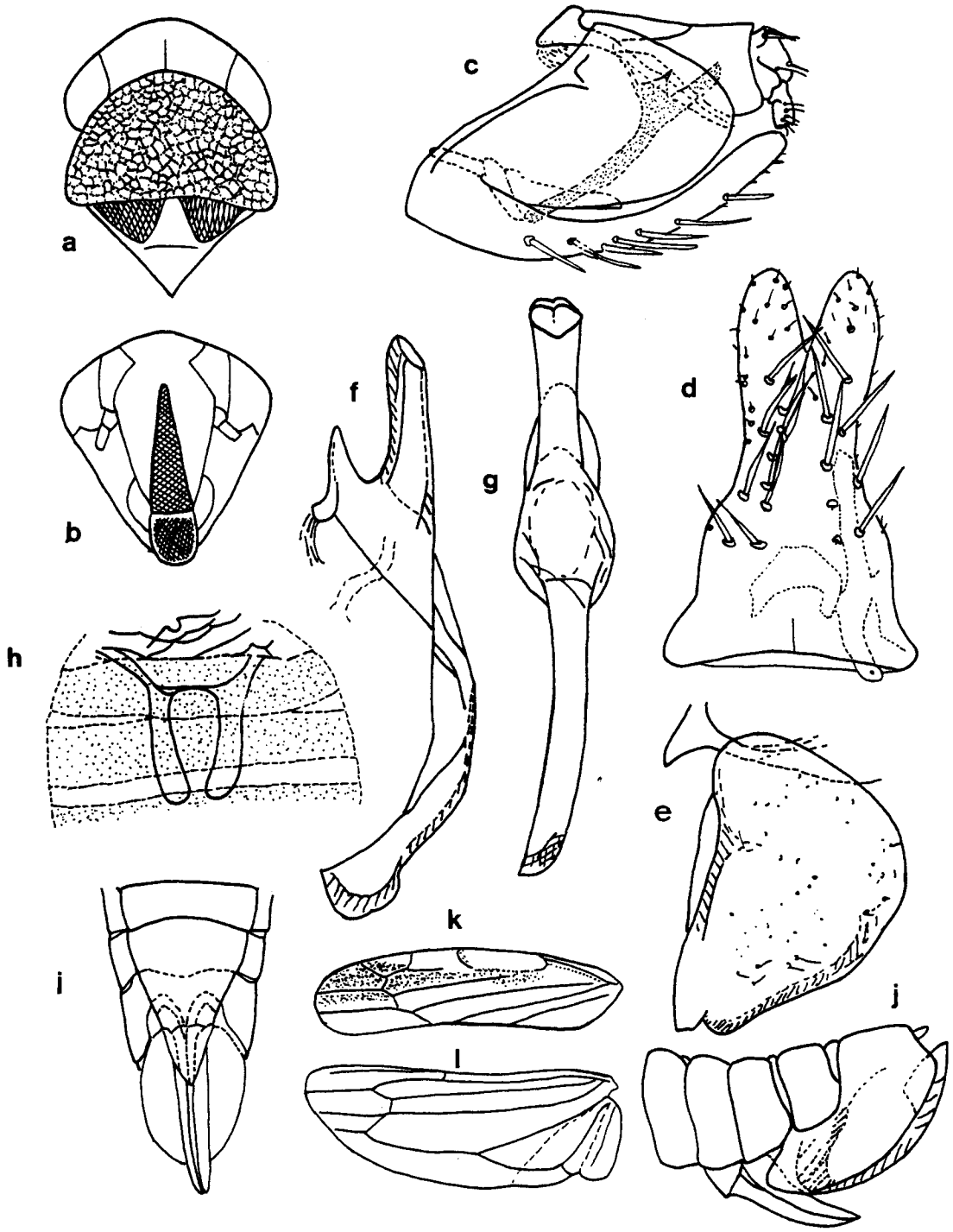
PLATE 1



Figures a – g. *Amrasca splendens* Ghauri a. head and thorax. b. frons. c. dorsal view of body d. tegmen e. hind wing f. subgenital plate g. aedeagus. H – K *Idioscopus clavosignatus* Maldonado Capriles h. head and thorax i. frons j. dorsal view of body k. aedeagus.

PLATE 2

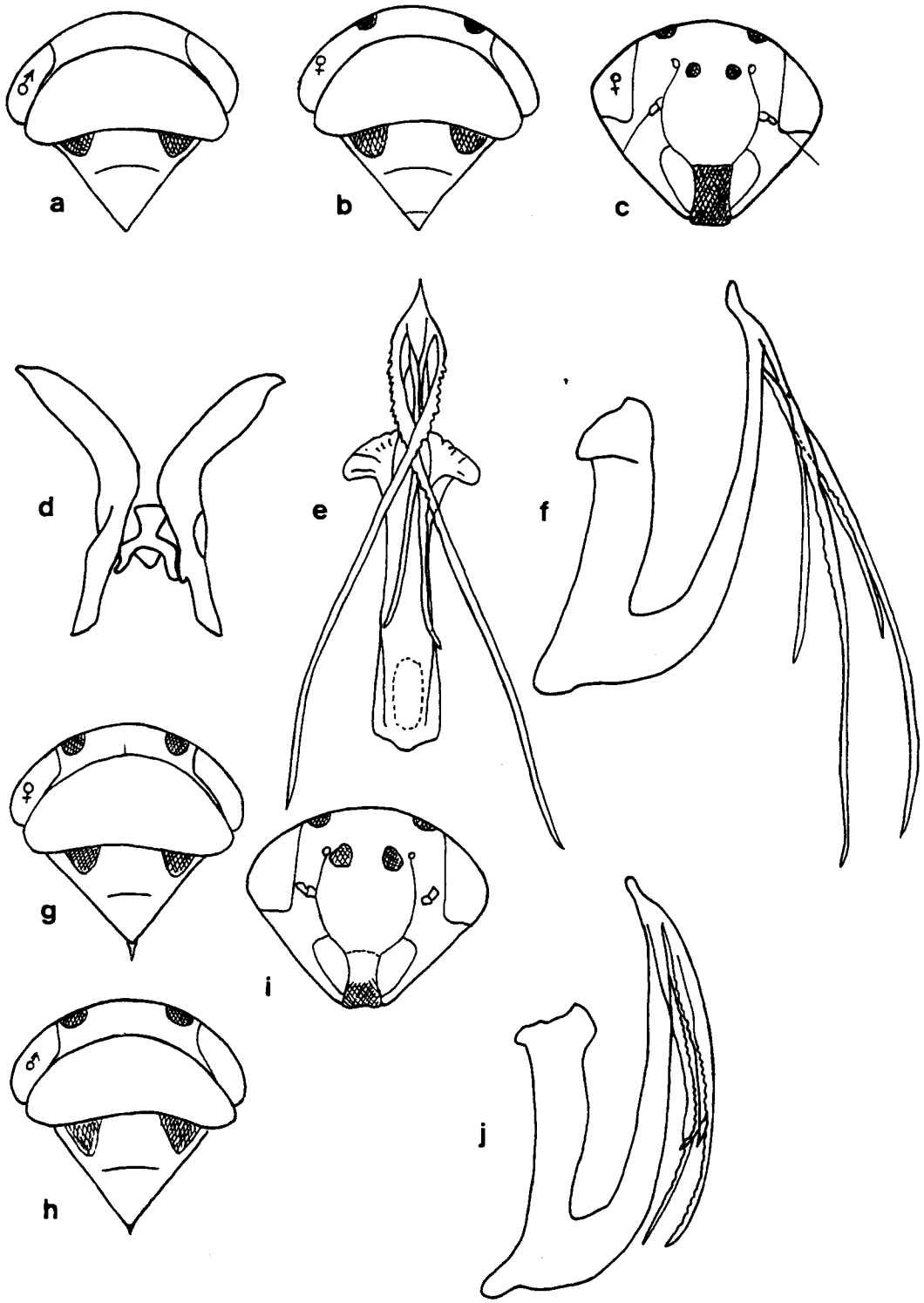
***Mangganeura reticulata* Ghauri**



Figures a–l *Mangganeura reticulata* Ghauri a. head and thorax b. frons c. genital capsule, lateral view d. subgenital plate e. pygofer f. aedeagus, dorsal view g. the same, dorsal view h. apodemes i. apical part of female abdomen j. the same, lateral view k. tegmen l. hind wing.

PLATE 3

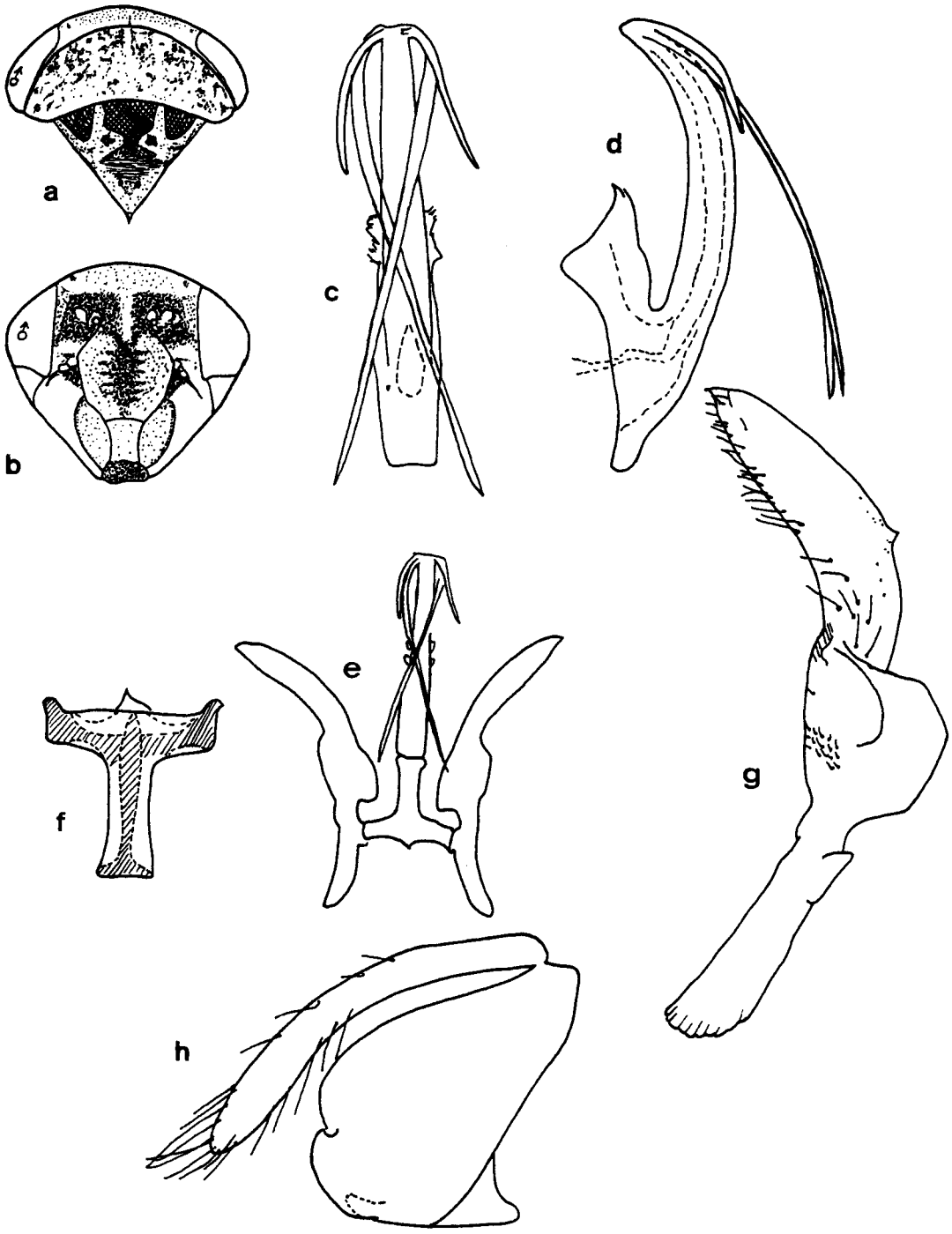
***Idioscopus* spp.**



Figures a – f *Idioscopus clypealis* (Leth)
a – b. head and thorax c. frons d. style and connective e. aedeagus, dorsal view f. the same, lateral view g – h. *Idoscopus nagpurensis* (Pruthi) i. frons j. aedeagus, lateral view.

PLATE 4

***Idioscopus niveosparsus* (Leth.)**

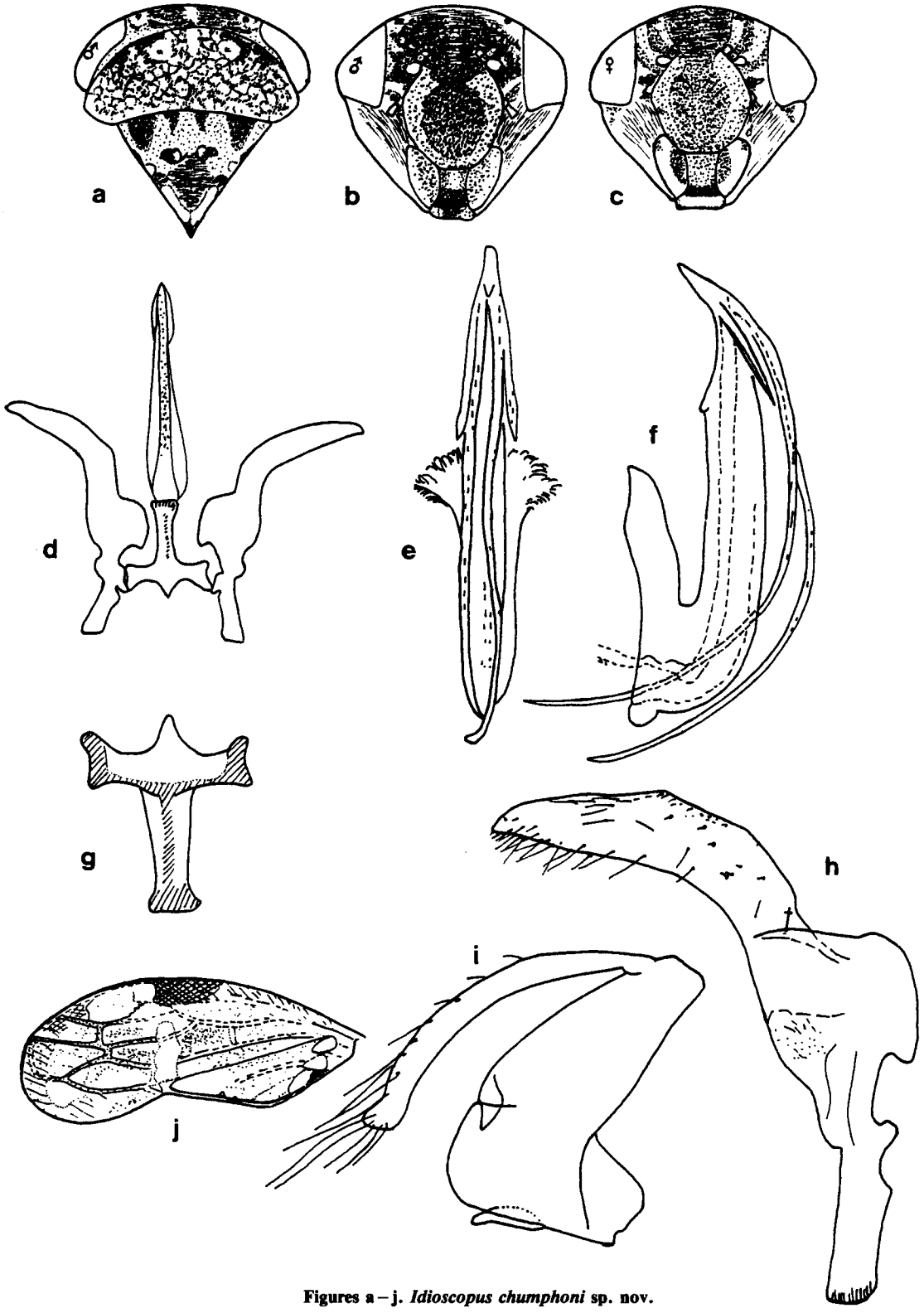


Figures a – f. *Idioscopus clypealis* (Leth)

a. haed and thorax b. frons c. aedeagus dorsal view d. the same, lateral view e. concealed genitalia, caudal view f. connective g. style h. genital capsule and plate.

PLATE 5

***Idioscopus chumphoni* sp. nov.**



Figures a – j. *Idioscopus chumphoni* sp. nov.

a. head and thorax, b. frons, male, c. frons, female, d. male internal genitalia, caudal view, e. aedeagus, caudal view f. the same, laterral view g. connective h. style I. genital capsule and male plate j. tegmen

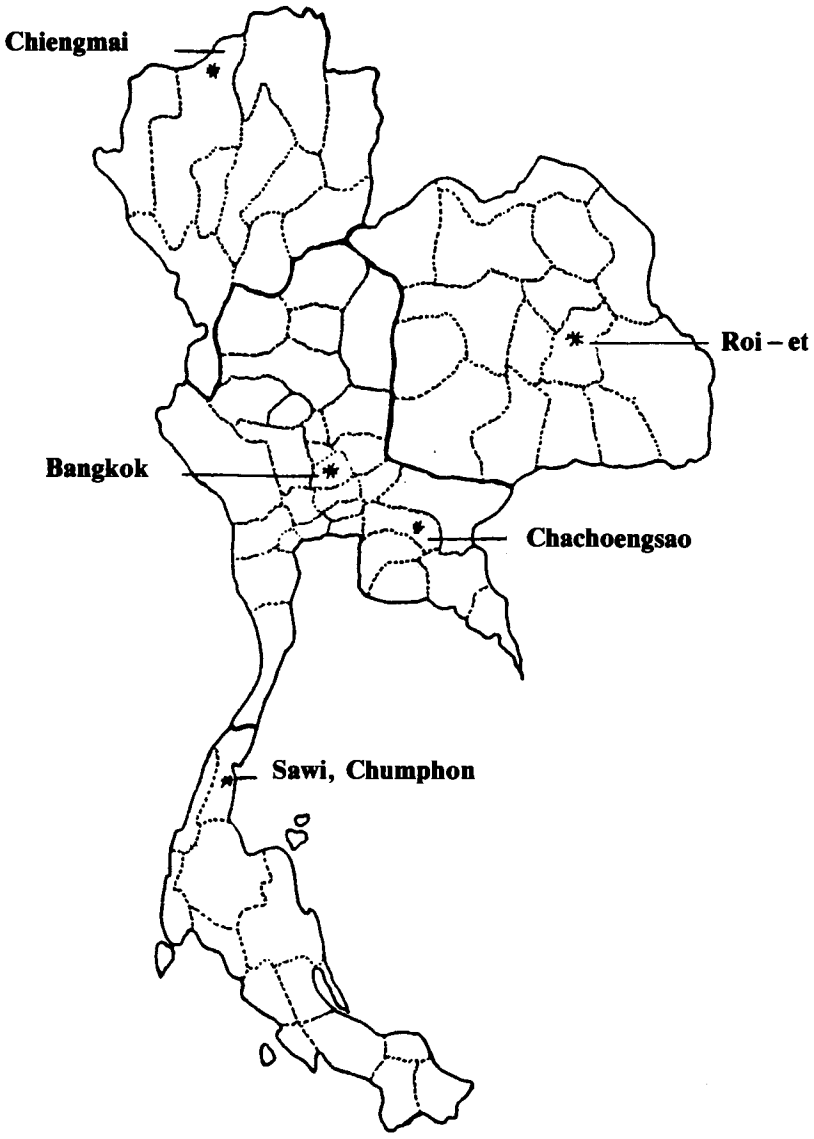


Figure 9. Map of Thailand.