AN UPDATED CHECKLIST OF THE MOSQUITOES FROM SOUTH SUMATRA PROVINCE WITH A NEW RECORD OF *AEDES* (*DOWNSIOMYIA*) *PEXUS* COLLESS, 1958 (DIPTERA: CULICIDAE) IN INDONESIA

Sidiq Setyo Nugroho*[1], Mujiyono[1], Triwibowo Ambar Garjito[1], Riyani Setiyaningsih[1], Siti Alfiah[1], Yahya[2], Anif Budiyanto[2] and Lasbudi Pertama Ambarita[2]

[1]Institute of Vector and Reservoir Control Research and Development, National Institute of Health Research and Development, Ministry of Health Indonesia
[2]Vector-borne Disease Research Unit of Baturaja, National Institute of Health Research and Development, Ministry of Health Indonesia
*Corresponding author: sidiqsnugroho148@gmail.com

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ABSTRACT

Data of mosquito fauna is important to be known as basic effort in vector mosquito control. It is necessary to update the data from time to time. The effort of updating the mosquito fauna was started from South Sumatra Province. Amount of 2,784 mosquito specimens were examined. The result showed there are 62 species of mosquitoes from South Sumatra Province and they belong to 10 genera. One species of culicid mosquito were recorded for the first time from Indonesia, namely *Aedes (Downsiomyia) pexus* and six other species were first recorded on Sumatra Island. These species are now included in the Sumatran Culicidae checklist.

Key words: Indonesia, mosquito fauna, new species record, South Sumatra

INTRODUCTION

Many species of Culicidae family, or known as mosquitoes, have been recognised as vectors of medically important pathogens and parasites such as viruses, protozoans, and nematodes that are causing diseases in human. Culicidae family includes two sub-families, 44 genera, 145 subgenera and 3,490 species worldwide (Harbach & Howard 2007). Ensuring the validity of the data of mosquito species and recognising the vectors of pathogens are essential to the development of effective control strategies for the diseases. Unfortunately, taxonomic data, especially in Sumatra Island has not been updated in the last three decades.

Indonesia has the second largest mosquito species diversity in the world after Brazil (Foley *et al*. 2007). More than 457 species of mosquitoes had been recorded from Indonesia, including 80 species of *Anopheles*, 6 species of *Bironella*, 1 species of *Aedeomyia*, 125 species of *Aedes*, 26 species of *Armigeres*, 5 species of *Heizmannia*, 82 species of *Culex*, 2 species of *Ficalbia*, 8 species of *Mimomyia*, 3 species of *Hodgesia*, 8 species of *Coquillettidia*, 8 species of *Mansonia*, 3 species of *Orthopodomyia*, 3 species of *Malaya*, 10 species of *Topomyia*, 44 species of *Tripteroides*, 30 species of *Uranotaenia*, and 13 species of *Toxorhynchites* (O'Connor & Sopa 1981).

Sumatra, which measures 1,800 kilometers long and 400 kilometers wide, is one of the major islands which has important contribution to the diversity of fauna, including mosquitoes. According to Brug & Bonne-Wepster (1947), there were 41 species of mosquitoes in Sumatra. The checklist of

mosquitoes of Sumatra provided by O'Connor & Sopa (1981) recognised 207 species. Ambarita & Sitorus (2006) and Sitorus *et al*. (2015) collected 15 mosquito species from South Sumatra. Although mosquito species were collected and data compiled for 35 years in Sumatra, there has not been an updated checklist published for the mosquitoes in this area.

The objective of this study is to provide for an updated checklist of the mosquitoes found in South Sumatra based on recent collecting in South Sumatra and also based on the collection data and reports in the literature. Collection data of insect vectors and animal reservoir of infectious diseases throughout the country have been deposited at the Institute for Vector and Control Research and Development (B2P2VRP), Salatiga, Central Java. The data was part of the national priority research project which the title of "Specific Research on Vector and reservoir diseases 2014 –2019", led by the National Institute of Health Research and Development (Balitbangkes). Ministry of Health Indonesia.

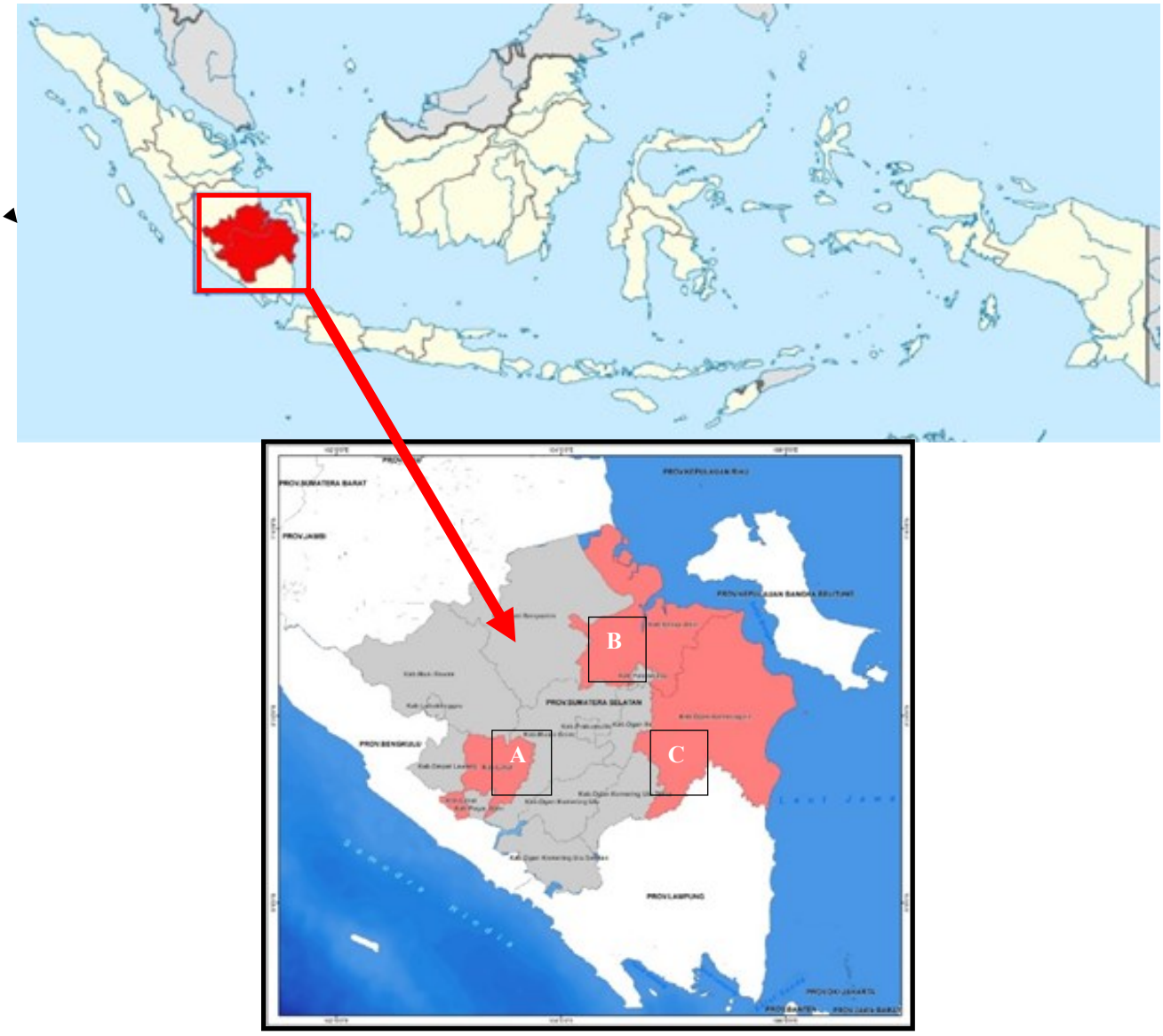

Figure 1. Relative situation of South Sumatra Province in Indonesian with the location of species collection, A. Lahat Regency, B. Banyuasin Regency, C. Ogan Komering Ilir Regency, South Sumatra Province.

MATERIALS AND METHODS

Study area is located in South Sumatra Province (1°37'27" – 4°55'17" S and 102°3'54" – 106°13'26" E). Field samplings were conducted in three regencies: Banyuasin, Lahat, and Ogan Komering Ilir (Fig. 1). Three ecosystems: forest, non-forest and coastal are selected for each regency. The adult mosquito specimens were collected all night by using four mosquito collection methods: human landing catch, animal-baited trap, collecting near cattle barn, and collecting resting mosquitoes using sweep nets. Mosquito larvae were collected using dippers and pipettes. Specimens were collected between May 15th – June 13th, 2015. Larvae were reared to obtain adult mosquitoes. Species were identified only from adult females. Mosquitoes identification were conducted using illustrated key by Rattanarithikul *et al*. (2005, 2006, 2010) under a stereo dissecting microscope with 4 – 56 x magnification. Information on collection locality, date, ecosystem type, collecting methods, and a number of specimens deposited is included for each species.

RESULTS

An updated checklist of mosquito from South Sumatra

Previous mosquito species checklists of Sumatra Island were provided by Brug & Bonne-Wepster (1947) with 41 species and O'Connor & Sopa (1981) with 207 species (Table 1). This research listed 62 species of mosquitoes belong to 10 genera. Thus South Sumatra provides 28.6% mosquitoes species from entire Sumatra Island.

New Mosquito Species Records for Indonesia

Aedes (Downsiomyia) pexus

Colless 1958:469 (M*, F, L*; as *Aedes*), type-loc.: MacRitchie Reservoir, Singapore (BM); Rattanarithikul *et al*. 2010: 1–152 (F*, L*; bionomic, distribution, keys)

Diagnostic characters of *Aedes pexus*: anterior pronotum with silvery scales; anterior pale-scaled area of scutum more or less straight posteriorly (Fig. 2a and 2b), without distinct mesal notch of dark scales and incompletely or not at all divided by median longitudinal stripe of dark scales; prealar scales absent; post-spiracular area without scales; dorsocentral setae absent; subspiracular scales absent. The latest mosquito distribution information mentioned that *Ae. pexus* was distributed in Malaysia, Singapore, and Thailand. The result of this study revealed that *Ae. pexus* also occurs in Indonesia (South Sumatra).

Table 1. Inventory of Culicidae from South Sumatra Province compared with previous mosquitoes species checklist for Sumatra Island

No.	Species Name	Location	O'Connor & Sopa (1981)	Brug & Bonne-Wepster (1947)
	SUBFAMILY ANOPHELINAE			
	Genus *Anopheles*			
	Subgenus *Anopheles*			
1	*aitkenii*		+	
2	*albotaeniatus*		+	
3	*argyropus*	A,C	+	
4	*baezai*		+	
5	*barbirostris*	A,B,C	+	+
6	*barbumbrosus*	A	+	
7	*brevipalpis*		+	
8	*crawfordi*		+	
9	*donaldi*		+	
10	*gigas* var. *sumaterana*		+	
11	*gigas* var. *danaubento*		+	
12	*gigas* var. *oedjalikalah*		+	
13	*gigas* var. *pantjarbatu*		+	
14	*hunteri*		+	
15	*insulaeflorum*		+	
16	*lesteri* ssp. *paraliae*		+	
17	*letifer*		+	
18	*montanus*		+	
19	*nigerrimus*	A,B	+	+
20	*nitidus*		+	
21	*palmatus*		+	
22	*peditaeniatus*	A,B	+	
23	*roperi*		+	
24	*separatus*		+	
25	*similissimus*		+	
26	*sinensis*	A	+	
27	*umbrosus*		+	+
	Subgenus *Cellia*			
28	*aconitus*		+	+
29	*annularis*	A	+	
30	*balabacensis*		+	
31	*flavirostris*		+	
32	*hackeri*		+	
33	*indefinitus*		+	
34	*karwari*		+	
35	*kochi*	A	+	+
36	*leucosphyrus*	A	+	+
37	*maculatus*	A	+	+
38	*minimus*		+	+
39	*nivipes*	A	+	
40	*pallidus*		+	
41	*parangensis*		+	

No.	Species Name	Location	O'Connor & Sopa (1981)	Brug & Bonne-Wepster (1947)
42	*philippinensis*		+	
43	*pujutensis*		+	
44	*ramsayi*		+	
45	*schueffneri*		+	
46	*subpictus*		+	+
47	*sundaicus*	C	+	+
48	*tessellatus*	A	+	
49	*vagus*	A,B	+	+
	SUBFAMILY CULICINAE			
	Tribe Aedeomyiini			
	Genus *Aedeomyia*			
	Subgenus *Aedeomyia*			
50	*catasticta*		+	
	Tribe Aedini			
	Genus *Aedes*			
	Subgenus *Aedimorphus*			
51	*alboscutellatus*		+	+
52	*caecus*	A,C	+	+
53	*lowisii*		+	
54	*mediolineatus*		+	
55	*pampangensis*		+	
56	*taeniorhynchoides*		+	
57	*vexans*	A,C	+	+
	Subgenus *Bruceharrisonius*			
58	*aureostriatus*		+	
59	*greenii*		+	
	Subgenus *Cancraedes*			
60	*indonesiae*		+	
61	*simplex*		+	
	Subgenus *Collessius*			
62	*macfarlanei*		+	
63	*shortti*		+	
	Subgenus *Danielsia*			
64	*albotaeniatus*		+	
	Subgenus *Downsiomyia*			
65	*albolateralis*		+	
66	*niveoides*		+	
67	*pexus* *	A		
68	*pseudoniveus*		+	
	Subgenus *Edwardsaedes*			
69	*imprimens*		+	+
	Subgenus *Finlaya*			
70	*macdougalli*		+	
71	*niveus*		+	
72	*notoscriptus* ssp. *montanus*		+	
73	*novoniveus*		+	
74	*poicilius*	A	+	+
75	*saxicola*		+	
	Subgenus *Lorrainea*			
76	*amesii*	B	+	
77	*fumidus*		+	
	Subgenus *Hulecoeteomyia*			
78	*chrysolineatus*		+	
79	*formosensis*		+	

No.	Species Name	Location	O'Connor & Sopa (1981)	Brug & Bonne-Wepster (1947)
80	*harveyi*		+	
	Subgenus *Mucidus*			
81	*aurantius*		+	
82	*laniger*		+	
83	*quasiferinus*		+	
	Subgenus *Neomelaniconion*			
84	*lineatopennis*	A	+	+
	Subgenus *Ochlerotatus*			
85	*vigilax*	A		+
	Subgenus *Paraedes*			
86	*ostentatio*		+	
	Subgenus *Phagomyia*			
87	*prominens* **	A		
	Subgenus *Rhinoskusea*			
88	*longirostris*		+	
	Subgenus *Scutomyia*			
89	*albolineatus*		+	+
	Subgenus *Stegomyia*			
90	*aegypti*	A,B,C	+	+
91	*albopictus*	A,B,C	+	+
92	*annandalei*		+	+
93	*paullusi*		+	
94	*pseudoalbopictus*		+	
95	*scutellaris*		+	+
96	*w-albus*		+	
	Genus *Armigeres*			
	Subgenus *Armigeres*			
97	*confusus*	A	+	
98	*durhami*		+	
99	*foliatus*		+	
100	*jugraensis*	A	+	
101	*kuchingensis* **	A		
102	*malayi*		+	+
103	*maximus*		+	
104	*moultoni*		+	
105	*obturbans*			+
106	*subalbatus*	A,B,C	+	
	Subgenus *Leicesteria*			
107	*annulipalpis*		+	
108	*annulitarsis*		+	
109	*balteatus*		+	
110	*digitatus*		+	
111	*dolichocephalus*		+	
112	*flavus*	A	+	
113	*longipalpis*		+	
114	*magnus*		+	
	Genus *Heizmannia*			
	Subgenus *Heizmannia*			

No.	Species Name	Location	O'Connor & Sopa (1981)	Brug & Bonne-Wepster (1947)
115	*communis*		+	
116	*scintillans*		+	
	Genus *Verrallina*			
	Subgenus *Neomacleaya*			
117	*andamanensis*	A,C	+	
118	*butleri*		+	
119	*incertus*		+	
120	*johorensis*		+	
121	*parasimilis*		+	
122	*priokanensis*		+	
123	*rarus*		+	
124	*uncus*		+	
125	*varietas*		+	
126	*virilis*		+	
	Tribe Culicini			
	Genus *Culex*			
	Subgenus *Acalleomyia*			
127	*obscurus*		+	
	Subgenus *Culex*			
128	*alis* **	A		
129	*fuscocephala*	A,B,C	+	+
130	*gelidus*	A,B,C	+	+
131	*mimulus*		+	+
132	*pseudovishnui*	A,B	+	
133	*sitiens*	B	+	+
134	*quinquefasciatus*	A,B,C	+	
135	*vishnui*	A,B,C	+	
136	*tritaeniorhynchus*	A,B,C	+	+
137	*whitei*	A	+	
138	*whitmorei*	A	+	+
	Subgenus *Culiciomyia*			
139	*fragilis*	A,B,C	+	
140	*nigropunctatus*	A,C	+	
141	*pallidothorax*		+	+
142	*spathifurca*		+	
	Subgenus *Eumelanomyia*			
143	*brevipalpis*		+	+
144	*malayi*		+	
	Subgenus *Lophoceraomyia*			
145	*cinctellus*		+	
146	*curtipalpis*		+	
147	*fraudatrix*		+	
148	*hewitti*		+	
149	*inculus*		+	
150	*infantulus*		+	
151	*jenseni*		+	

No.	Species Name	Location	O'Connor & Sopa (1981)	Brug & Bonne-Wepster (1947)
152	*macdonaldi*		+	
153	*mammilifer*		+	
154	*minor* **	A		
155	*peytoni*		+	
156	*reidi*		+	
157	*rubithoracis*	A	+	
158	*sumateranus*		+	
159	*traubi*		+	
160	*variatus*		+	
161	*whartoni*		+	
	Subgenus *Oculeomyia*			
162	*bitaeniorhynchus*	A,B,C	+	+
163	*infula*	C	+	
164	*sinensis*	A,B,C	+	+
	Genus *Lutzia*			
	Subgenus *Metalutzia*			
165	*fuscanus*	A	+	+
166	*halifaxii*		+	+
	Tribe Ficalbiini			
	Genus *Mimomyia*			
	Subgenus *Etorleptiomyia*			
167	*luzonensis*		+	
	Subgenus *Mimomyia*			
168	*chamberlaini*		+	
169	*chamberlaini* ssp. *metallica*		+	
170	*hybrida*		+	
	Tribe Mansoniini			
	Genus *Coquillettidia*			
	Subgenus *Coquillettidia*			
171	*aureosquammata*		+	
172	*crassipes*	A,B	+	+
173	*giblini*		+	
174	*nigrochracea*		+	
175	*nigrosignata*		+	
176	*ochracea*		+	
	Genus *Mansonia*			
	Subgenuns *Mansonioides*			
177	*annulata*	B,C	+	
178	*annulifera*	B,C	+	+
179	*bonneae*	B	+	
180	*dives*	B,C	+	
181	*indiana*	B,C	+	+
182	*uniformis*	A,B,C	+	+

No.	Species Name	Location	O'Connor & Sopa (1981)	Brug & Bonne-Wepster (1947)
	Tribe Orthopodomyiini			
	Genus *Orthopodomyia*			
183	*anopheloides*		+	
	Tribe Sabethini			
	Genus *Malaya*			
184	*jacobsoni*	C	+	
185	*genurostris*	A,C	+	
	Genus *Topomyia*			
	Subgenus *Suaymyia*			
186	*argenteoventralis*		+	
	Subgenus *Topomyia*			
187	*gracilis*		+	
188	*pilosa*		+	
189	*rubithoracis*		+	
190	*tipuliformis*		+	
	Genus *Tripteroides*			
	Subgenus *Rachionotomyia*			
191	*aranoides*		+	
	Subgenus *Tripteroides*			
192	*plumosus*		+	
193	*powelli*		+	
194	*proximus*		+	
195	*similis*		+	
196	*vicinus*		+	
	Tribe Toxorhynchitini			
	Genus *Toxorhynchites*			
	Subgenus *Toxorhynchites*			
197	*aurifluus*		+	
198	*coeruleus*		+	
199	*gravelyi*		+	
200	*kempi* **	A		
201	*metallicus*		+	
202	*minimus*		+	
203	*quasiferox*		+	
204	*splendens*	A	+	+
205	*sumateranus*	A	+	
	Tribe Uranotaeniini			
	Genus *Uranotaenia*			
	Subgenus *Pseudoficalbia*			
206	*ascidiicola*		+	
207	*gigantea*		+	
208	*hirsutifemora*		+	
209	*moultoni*		+	
210	*obscura*		+	

No.	Species Name	Location	O'Connor & Sopa (1981)	Brug & Bonne-Wepster (1947)
	Subgenus *Uranotaenia*			
211	*campestris*		+	
212	*lateralis*	A	+	
213	*longirostris* **	B		
214	*macfarlanei*		+	

* new record for Indonesia, ** new records for Sumatra Island ; A. Lahat ; B. Banyuasin; C. Ogan Komering Ilir

Adult of subgenus *Downsiomyia* species is easily recognised by the presence of broad decumbent scales on the vertex and erect scales on the occiput of the head, the presence of patches of pale scales covering the scutal fossae and by the absence of acrostichal and dorsocentral setae and post-spiracular scales. Species of subgenus *Downsiomyia* occur in the Oriental Region and adjoining areas of the Australasian and Palaearctic Regions (Harbach 2008a).

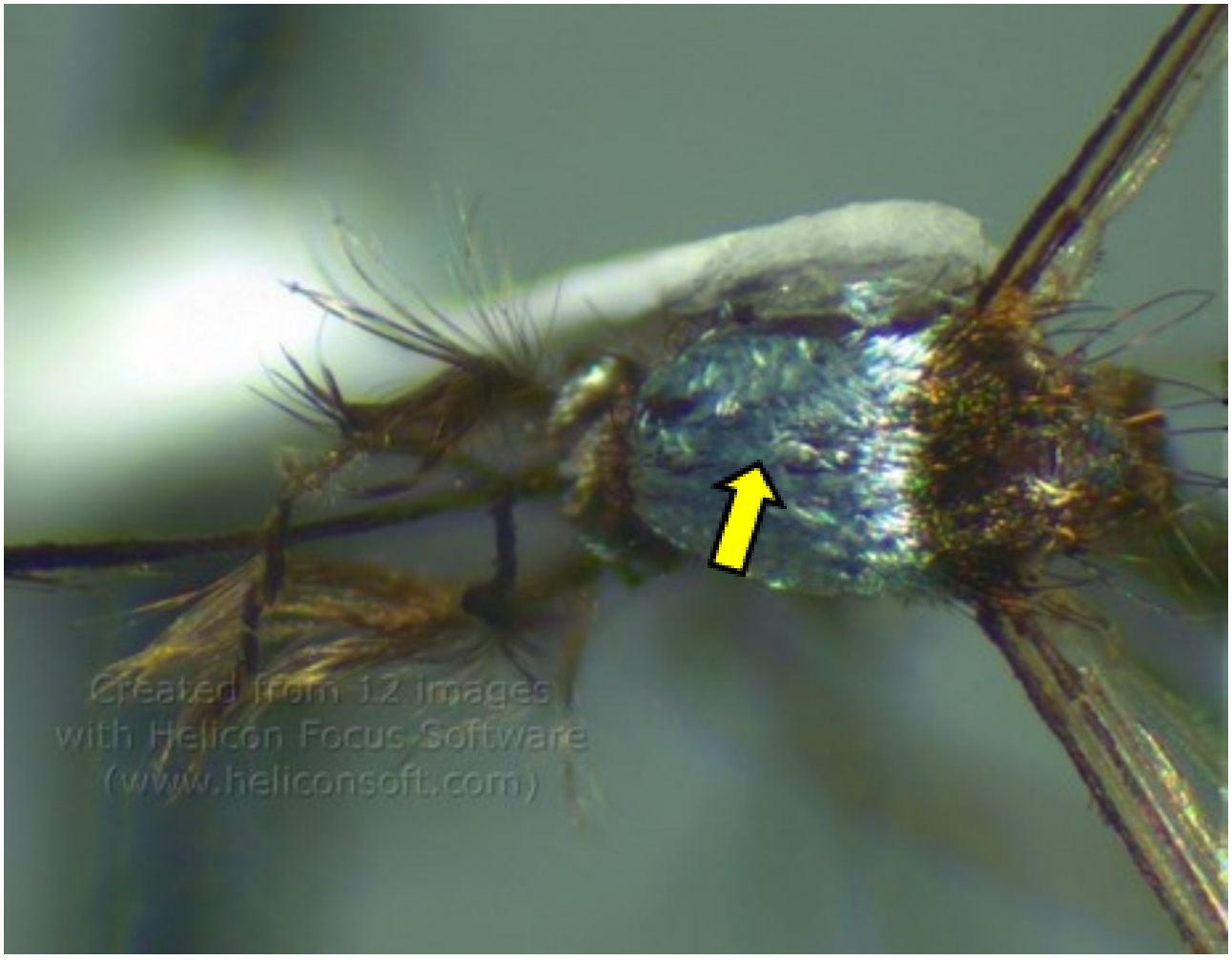

Figure 2a. Thorax of *Aedes pexus*, with pattern of white scales in the anterior three fourth of mesonotum and tuft in the sternite.

Figure 2b. Abdomen of *Aedes pexus*, with pattern of white scales in the anterior three fourth of mesonotum and tuft in the sternite.

New mosquito species records for Sumatra Island

1. Aedes (Phagomyia) prominens

Barraud 1923d:228 (M, F; as ?), type-loc: Sukna, [Darjeeling District, West] Bengal, India (BM); Borel 1930:262 (M*, F, L*); Barraud 1934:169 (M, F, L); Rattanarithikul *et al*. 2010:1–152 (F*, L*; bionomics, distribution, keys)

Diagnostic characters of *Aedes prominens* (Fig. 3): Hind tarsomeres with both basal and apical pale bands, abdominal sterna with long outstanding scale-tufts, postpronotum with patch of broad white scales. *Aedes prominens* was reported to occur in Cambodia, China, India, Indonesia, Malaysia, Nepal, Thailand, and Vietnam.

Species of subgenus *Phagomyia* are characterised and distinguished from species of another subgenus of Aedini by the following combination of characters. Scutum with a large anterior area

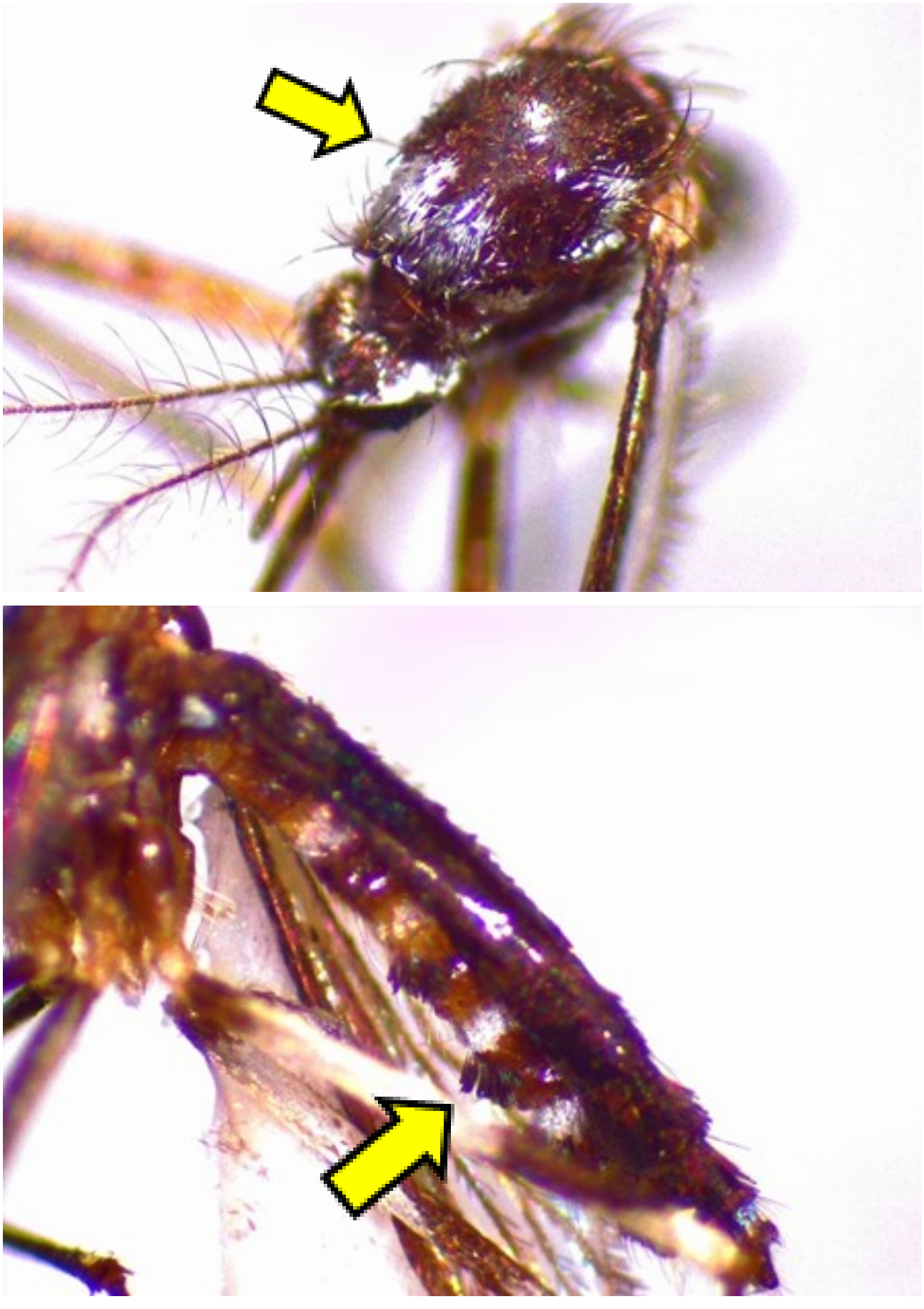

Figure 3. Thorax and abdomen of *Aedes prominens*, scutum shown covered with white scales and long outstanding scale-tufts in abdomen.

covered with pale scales (covering anterior 0.30–0.70 of acrostichal, dorsocentral and scutal fossal areas), pale scaling sometimes divided partially or completely in the middle (anterior and posterior acrostichal areas without pale stripe). Species of subgenus *Phagomyia* primarily occur in the Oriental Region. One or two species extend into far eastern areas of the Palaearctic, one occurs in Southeast Asia and Sulawesi and at least two species are known from the Australasian Region (northern Australia and New Guinea) (Harbach 2008b).

2. Armigeres (Armigeres) kuchingensis

Edwards 1915c:283 (M, F), type-loc.: Kuching Reservoir, Sarawak, Borneo (BM); Borel 1930:186 (M*, F, L*); Edwards, in Barraud 1834:314 (taxonomy); Stone & Thurman 1958:240 (M*; resurrected from synonymy with *obturbans*); Thurman 1959:86 (M*, L)

Joshi *et al.* 1965:138 (distribution, Nepal); Ahmed 1987:187 (distribution)

Darsie 2000a102(1): 109 (P*; taxonomy; key); Rattanarithikul *et al*. 2010: 1-152 (F*, L*; bionomics, distribution, keys)

Diagnostic characters of *Armigeres kuchingensis* (Fig. 4): abdominal sterna III-VI entirely pale scaled, scutum with lateral border of white scales not extending around margin, abdominal sterna VII with basal dark band. *Ar. kuchingensis* was reported to occur in Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, Philippines, Thailand, and Vietnam.

The adults of subgenus *Armigeres* are easily distinguished from those of subgenus *Leicesteria* by the presence of post-spiracular setae and a lower mesepimeral seta. Species of subgenus *Armigeres* occur in the Oriental, Palaeartic and Australasian Regions (Harbach 2008c).

3. *Culex (Lophoceraomyia) minor*

Leicester 1908:126 (M, F; Lophoceraomyia), type-loc.: [Kuala Lumpur, Selangor], Malaya [Malaysia] (BM); Mattingly 1949c:227 (L*; taxonomy); Colless 1965:289 (M*, F, L*; synonymy); Sirivanakarn 1977a:98 (M*, F, P*, L*; distribution); Rattanarithikul *et al*. 2005: 1–97 (F*, L*; bionomics, distribution, keys)

Diagnostic characters of *Culex minor*: vertex largely with narrow decumbent scales, if broad then on ocular line, abdominal terga completely dark, lower mesepimeral setae present. *Culex minor* has been reported to occur in Cambodia, China, India, Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

Lophoceraomyia is largely confined to tropical and subtropical areas and island of the Oriental and Australasian Regions, with a small extension into southeastern areas (China, Japan, and Korea) of the Palaearctic Region (Harbach 2008d).

Figure 4. Thorax and abdomen of *Armigeres kuchingensis*, the scutum shown with lateral border of white scales not extending around margin and basal dark band on abdominal sternum VII.

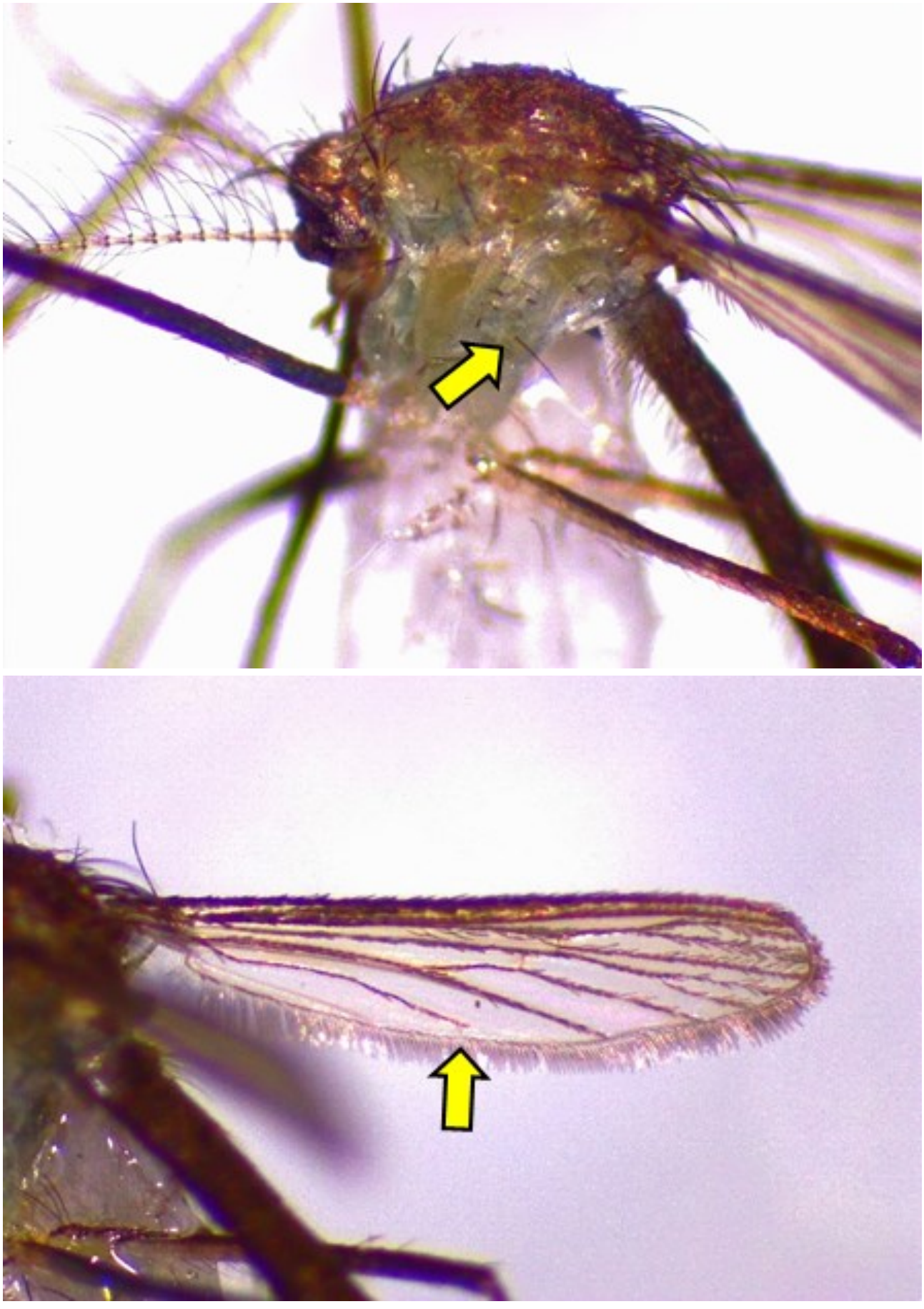

Figure 5. Thorax and wing of *Culex minor,* with mesepimeral setae shown and vein 1A/anal vein ends before apex of crossvein medio-cubital.

DISCUSSION

A total of 214 mosquito species was reported to be distributed in South Sumatra, consisting of two sub families and 11 genera. The updated checklist is obtained from previous references and field collection during the study. *Anopheles* is a genus with the largest number of species in South Sumatra. While *Culex* and *Aedes* are the genera that also have quite a lot variety of species in the region. Several mosquitoes species are reported only distributed in Sumatra, includes *An. nivipes*, *Malaya jacobsoni,* and *Toxorhynchites sumatranus*.

Adult male *Ae. pexus* have been reared from larva collected from unused latex container in rubber trees cultivation near forest in Perangai Village, Lahat Regency. Six species member of *Aedes* subgenus *Downsiomyia* occur in Indonesia, all of them are distributed in the Oriental Region especially in Sumatra, Java, and Borneo. Larvae of *Aedes* subgenus *Downsiomyia* have been found in tree holes and occasionally in bamboo stumps, bamboo cups, split bamboo, and bamboo internodes (Rattanarithikul *et al.* 2010). One species of *Aedes* subgenus *Downsiomyia*, *Ae. harinasutai*, is a recognised vector filarial parasite *Wuchereria bancrofti* in forested area of Kanchaburi Province, western Thailand (Gould *et al.* 1982).

Phagomyia is resurrected from synonymy with *Finlaya* for the species of Gubernatoris group. Larvae of *Ae. prominens* are commonly found in rock pools, rock holes, tree holes, stump holes, bamboo stumps, bamboo pots, bamboo internodes, split bamboo, and occasionally in artificial containers (Rattanarithikul *et al.* 2010). Adult has been collected by biting humans. In Indonesia, *Ae. prominens* have been collected only from Sulawesi island (O'Connor & Sopa 1981).

Larvae of *Ar. kuchingensis* are found in coconut husk, coconut shell, and bamboo internodes (Rattanarithikul *et al.* 2010). Adults were collected in Nepal at the human bait and inside houses. Daytime resting on bushes and flowers near human dwelling was observed. *Ar. kuchingensis* is a persistent human daytime biter (Darsie & Pradhan 1990). This species was previously found in Kalimantan and Java island (O'Connor & Sopa 1981), but now also occurs in Sumatra island.

Culex alis is included in Sitiens complex of subgenus *Culex* along with another coastal, brackish water species, *Cx. sitiens* (Sirivanakarn 1976). Larvae of this species have been found in ground pools, rice fields, crab holes, rock pools, and rock holes at or near coastal beaches (Rattanarithikul *et al.* 2005). Distribution of this species in Indonesia was recorded from Kalimantan, Maluku, and Irian Jaya (O'Connor & Sopa 1981).

The adults and immatures of *Culex minor* are very abundant and have frequently collected. The main breeding sites include bamboos and tree holes (Sirivanakarn 1977). *Cx. minor* appear to attack man in an occasion, though presumably, the normal host is forest animal (Colless 1965). Previously, *Cx. minor* has been recorded from some places in Indonesia include Kalimantan, Java, and Irian Jaya, but now *Cx. minor* is also recorded in Sumatra Island (O'Connor & Sopa 1981).

Larvae of *Toxorhynchites kempi* were reported found in bamboo and associated with *Ae. alcasidi*, *Ae. albopictus* and *Tripteroides nitidoventer* (Miyagi *et al.* 1985). The immatures of *Uranotaenia (Ura.) longirostris* were found in swamp, stream margin, foot prints, mangrove, crab hole, and crab hole (Rattanarithikul *et al.* 2006). In Indonesia *Ur. longirostris* was only found in Java island (O'Connor & Sopa 1981).

Previous research conducted in Banyuasin Regency and South Ogan Komering Ulu Regency have added four species to the checklist of mosquitoes of South Sumatra. Those added species were *An. separatus, Cx. hutchinsoni, Cx. sinensis*, and *Cx. solitarius* (Ambarita & Sitorus 2006, Sitorus *et al.* 2015). Thus total mosquito species in South Sumatra are 66 species and this number contributes 30.4% of mosquito species from entire Sumatra Island.

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