

Table 3.1 Natural *Plasmodium* species infections of *Anopheles* mosquitoes in Indonesia

Species	Year of samples	Oocyst detection		Sporozoite detection			<i>Plasmodium</i> infection				
		Number of mosquitoes examined	Number of mosquitoes with oocysts	Oocyst rate (%)	Number of mosquitoes examined	Number of mosquitoes with sporozoites	Sporozoite rate (%)	<i>P. falciparum</i>	<i>P. vivax</i>	<i>P. malariae</i>	<i>P. ovale</i>
<i>An. aconitus</i>	1917–2007	8827	115	1.30	17,554	15	0.09	Yes	Yes	?	?
<i>An. aitkenii</i>	1919	2	0	0.00	–	–	–				
<i>An. albotaeniatus</i>	1918–1931	48	0	0.00	6	0	0.00				
<i>An. annularis</i>	1917–2007	1229	2	0.16	489	0	0.00				
<i>An. balabacensis</i>	1982–2005	–	–	–	2348	111	4.73	Yes	Yes	?	?
<i>An. bancroftii</i>	1928–2002	1119	29	2.59	983	2	0.20	?	?	?	?
<i>An. barbirostris</i>	1917–2007	6750	314	4.65	9568	91	0.95	Yes	Yes	?	?
<i>An. barbumbrosus</i>	1940–2002	19	1	5.26	22	1	4.55	?	?	?	?
<i>An. crawfordi</i>	1994–2002	–	–	–	773	0	0.00				
<i>An. farauti</i>	1922–1979	1093	57	5.22	1199	12	1.00	Yes	Yes	?	?

<i>An. flavirostris</i>	1938–2007	53	5	9.43	2175	2	0.09	Yes	?	?	?
<i>An. hyrcanus</i>	1918–1929	30,055	682	2.27	–	–	–				
<i>An. indefinitus</i>	1917–2007	2413	1	0.04	173	0	0.00				
<i>An. karwari</i>	1919–1955	65	0	0.00	685	6	0.88	?	?	?	?
<i>An. kochi</i>	1917–2007	7223	89	1.23	2967	1	0.03	Yes	Yes	?	?
<i>An. koliensis</i>	1947–1994	–	–	–	2616	24	0.92	?	Yes	?	?
<i>An. leucosphyrus</i>	1918–1986	3757	324	8.62	89	1	1.12	Yes	?	?	?
<i>An. longirostris</i>	1953–1964	–	–	–	7	0	0.00				
<i>An. maculatus</i>	1918–2007	1289	26	2.02	3504	6	0.17	Yes	Yes	?	?
<i>An. nigerrimus</i>	1932–1995	5074	483	9.52	3443	11	0.32	?	?	?	?
<i>An. parangensis</i>	1939–2002	2	0	0.00	688	6	0.87	Yes	?	?	?
<i>An. peditaeniatus</i>	1934–2007	–	–	–	594	0	0.00				

Continued

Table 3.1 Natural *Plasmodium* species infections of *Anopheles* mosquitoes in Indonesia—cont'd

Species	Year of samples	Oocyst detection		Sporozoite detection			<i>Plasmodium</i> infection				
		Number of mosquitoes examined	Number of mosquitoes with oocysts	Oocyst rate (%)	Number of mosquitoes examined	Number of mosquitoes with sporozoites	Sporozoite rate (%)	<i>P. falciparum</i>	<i>P. vivax</i>	<i>P. malariae</i>	<i>P. ovale</i>
<i>An. punctulatus</i>	1917–1992	1614	1	0.06	10,501	117	1.11	Yes	Yes	Yes	?
<i>An. sinensis</i>	1917–1998	29,489	612	2.08	2733	1	0.04	?	?	?	?
<i>An. subpictus</i>	1918–2007	32,698	130	0.40	88,784	160	0.18	Yes	Yes	?	?
<i>An. sundaicus</i>	1917–2007	49,649	1469	2.96	56,624	169	0.30	Yes	Yes	?	?
<i>An. tessellatus</i>	1919–2007	2266	4	0.18	838	10	1.18	Yes	?	?	?
<i>An. umbrosus</i>	1918–1921	257	16	6.23	25	0	0.00				
<i>An. vagus</i>	1919–2007	10,303	2	0.02	6844	7	0.10	Yes	?	?	?

The '?' mark denotes where the *Plasmodium* species infecting the mosquitoes is unknown. In some instances, the observed oocysts and sporozoites upon dissection might have been derived from non-human primate or rodent hosts. 'Yes' indicate parasite species was identified using CSP-ELISA.

The database of susceptibility of *Anopheles* mosquitoes to *Plasmodium* spp. infections in Indonesia was acquired from the following references:

An. aconitus: Bangs and Rusmiarto (2007), Barodji et al. (2007), Boesri et al. (2004), Boesri and Boewono (2006), Boewono and Ristiyanto (2005), Bosh (1925), Doorenbos (1927, 1931), Hoedjo (1995), Kirnowardoyo et al. (1985), Lestari et al. (2007), Lien et al. (1975), Mangkoewinoto (1919), Marwoto et al. (1992a), Nalim et al. (2000), Schuurman and Huinink (1929), Soesilo (1935), Stoops et al. (2009b), Sundararaman et al. (1957), Swellengrebel and Rodenwaldt (1932), Swellengrebel et al. (1919) and Walch and Walch-Sordrager (1922).

An. aitkenii: Swellengrebel and Swellengrebel-de Graaf (1920).

An. albotaeniatus: Doorenbos (1927, 1931), Mangkoewinoto (1919), Swellengrebel and Rodenwaldt (1932) and Walch and Walch-Sordrager (1922).
An. annularis: Barodji et al. (2007), Boesri (1994b), Boesri and Boewono (2006), Hoedojo (1992, 1995), Kimnowardoyo et al. (1985), Lien et al. (1975), Maekawa et al. (2009b), Schuurman and Huinink (1929), Soesilo (1935), Stoops et al. (2009b), Swellengrebel and Rodenwaldt (1932), Swellengrebel and Swellengrebel-de Graaf (1920) and Venhuis (1941).
An. balabacensis: Adrial et al. (2000), Boesri and Boewono (2006), Boewono and Nalim (1996), Boewono and Ristiyanto (2005), Harbach et al. (1987), Lestari et al. (2007), Maekawa et al. (2009b), Pranoto and Prasetyo (1990), White (1983) and Wigati et al. (2006).
An. bancroftii: De Rook (1929), Metselaar (1956), Nurdin et al. (2003) and Van den Assem and Bonne-Wepster (1964).
An. barbirostris: Barodji et al. (2007), Boesri (1994b), Boesri and Boewono (2006), Boewono and Nalim (1996), Boewono et al. (1997a), Boewono and Ristiyanto (2005), Collins et al. (1979), Doorenbos (1927, 1931), Gundelfinger et al. (1975), Kimnowardoyo et al. (1985), Lestari et al. (2007), Lien et al. (1975), Machsoes (1939), Maekawa et al. (2009b), Mangkoewinoto (1919), Marwoto et al. (2002), Marwoto et al. (1992a), Marwoto et al. (1996), Nalim et al. (2000), Nurdin et al. (2003), Soesilo (1935), Stoops et al. (2009b), Sukowati et al. (2001), Sukowati et al. (2002), Swellengrebel and Rodenwaldt (1932), Swellengrebel et al. (1919), Swellengrebel and Swellengrebel-de Graaf (1920), Van Hell (1952), Venhuis (1941), Walch and Walch-Sordrager (1922) and Widjaya et al. (2006).
An. barbumbrosus: Nurdin et al. (2003), Sekartuti et al. (1995b) and Van Hell (1952).
An. crawfordi: Boewono and Nalim (1996), Boewono et al. (1997a), Fryauff et al. (2002) and Nurdin et al. (2003).
An. farauti: Bangs and Rusmiarto (2007), Boyd (1949), De Rook (1929), Lee et al. (1980), Metselaar (1956), Swellengrebel and Rodenwaldt (1932) and Van den Assem and Bonne-Wepster (1964).
An. flavirostris: Barodji et al. (1998/1999), Boewono and Ristiyanto (2005), Lestari et al. (2007), Maekawa et al. (2009b), Overbeek and Stoker (1938), Stoops et al. (2009b), Sundararaman et al. (1957), Van Hell (1952), Venhuis (1941) and Wigati et al. (2006).
An. hyrcanus: Swellengrebel and Rodenwaldt (1932).
An. indefinitus: Boewono and Nalim (1996), Kimnowardoyo et al. (1985), Maekawa et al. (2009b), Stoops et al. (2009b), Swellengrebel et al. (1919) and Walch and Walch-Sordrager (1922).
An. karwari: Metselaar (1956), Swellengrebel and Swellengrebel-de Graaf (1920) and Van den Assem and Bonne-Wepster (1964).
An. kochi: Bangs and Rusmiarto (2007), Barodji et al. (2007), Boesri and Boewono (2006), Boewono and Nalim (1996), Boewono et al. (1997a), Boewono and Ristiyanto (2005), Bosh (1925), Doorenbos (1927, 1931), Fryauff et al. (2002), Hoedojo (1992, 1995), Kimnowardoyo et al. (1985), Lestari et al. (2007), Lien et al. (1975), Nalim et al. (2000), Sekartuti et al. (1995b), Soekirno et al. (1997), Soesilo (1935), Stoops et al. (2009b), Sundararaman et al. (1957), Swellengrebel and Rodenwaldt (1932), Swellengrebel et al. (1919), Swellengrebel and Swellengrebel-de Graaf (1920), Venhuis (1941) and Walch and Walch-Sordrager (1922).
An. koliensis: Bangs et al. (1996), Church et al. (1995), Lee et al. (1980), Metselaar (1956), Pribadi et al. (1998) and Van den Assem and Bonne-Wepster (1964).
An. leucosphyrus: Bosh (1925), Doorenbos (1927), Harbach et al. (1987), Machsoes (1939), McArthur (1951), Swellengrebel and Rodenwaldt (1932), Swellengrebel and Swellengrebel-de Graaf (1920) and Van Hell (1952).
An. longirostris: Metselaar (1956) and Van den Assem and Bonne-Wepster (1964).
An. maculatus: Barodji et al. (2007), Boesri and Boewono (2006), Boewono and Ristiyanto (2005), Doorenbos (1927, 1931), Kimnowardoyo et al. (1985), Kimnowardoyo et al. (1991), Lestari et al. (2007), Lien et al. (1975), Maekawa et al. (2009b), Marwoto et al. (1992a), Stoops et al. (2009b), Sundararaman et al. (1957), Swellengrebel and Rodenwaldt (1932), Swellengrebel and Swellengrebel-de Graaf (1920), Venhuis (1941) and Wigati et al. (2006).
An. nigerrimus: Bangs and Rusmiarto (2007), Boesri (1994b), Boewono and Nalim (1996), Boewono et al. (1997a), Kimnowardoyo et al. (1991), Nalim et al. (2000), Overbeek (1940), Sundararaman et al. (1957), Swellengrebel and Rodenwaldt (1932), Van Hell (1952) and Venhuis (1941).
An. parangensis: Machsoes (1939), Marwoto et al. (2002), Marwoto et al. (1996) and Nurdin et al. (2003).
An. peditaeniatus: Boewono and Nalim (1996), Boewono et al. (1997a), Lien et al. (1975), Soesilo (1935) and Stoops et al. (2009b).
An. punctulatus: Bangs et al. (1996), Church et al. (1995), Doorenbos (1927, 1931), Lee et al. (1980), Metselaar (1956), Pribadi et al. (1998), Swellengrebel et al. (1919), Swellengrebel and Swellengrebel-de Graaf (1920), Van den Assem and Bonne-Wepster (1964) and Walch and Walch-Sordrager (1922).

An. sinensis: Boewono and Nalim (1996), Boewono et al. (1997a), Bosh (1925), Doorenbos (1931), Fryauff et al. (2002), Lien et al. (1975), Mangkoewinoto (1919), Schuurman and Huinink (1929), Soesilo (1935), Sundararaman et al. (1957), Swellengrebel et al. (1919), Swellengrebel and Swellengrebel-de Graaf (1920), Walch and Walch-Sordrager (1922) and Walch (1924).

An. subpictus: Barodji et al. (1999/2000), Boesri and Boewono (2006), Collins et al. (1979), Dasuki and Supratman (2005), Gundelfinger et al. (1975), Hoedjo (1992, 1995), Issaris and Sundararaman (1954), Machsoes (1939), Maekawa et al. (2009b), Mangkoewinoto (1919), Marwoto et al. (2002), Marwoto et al. (1992a), Marwoto et al. (1996), Nalim et al. (2000), Nurdin et al. (2003), Sekartuti et al. (1995b), Soekirno et al. (1997), Soesilo (1928, 1935), Sukowati et al. (2001), Sundararaman et al. (1957), Swellengrebel and Rodenwaldt (1932), Swellengrebel et al. (1919), Swellengrebel and Swellengrebel-de Graaf (1920) and Van Hell (1952).

An. sundaius: Boewono and Nalim (1996), Boewono et al. (1997a), Bosh (1925), Collins et al. (1979), Doorenbos (1931), Fryauff et al. (2002), Isfarain and Santiyo (1981), Isfarain and Santyo (1981), Issaris and Sundararaman (1954), Kirnowardoyo et al. (1991), Lien et al. (1975), Maekawa et al. (2009b), Mangkoewinoto (1919), Marwoto et al. (1992a), Nalim et al. (2000), Overbeek and Stoker (1938), Soesilo (1928), Stoops et al. (2009b), Sundararaman et al. (1957), Swellengrebel and Rodenwaldt (1932), Swellengrebel et al. (1919), Swellengrebel and Swellengrebel-de Graaf (1920), Takken et al. (1990), Van Breemen and Sunier (1919), Van Hell (1952) and Walch (1924).

An. tessellatus: Bangs and Rusmiarto (2007), Boesri and Boewono (2006), Boewono and Nalim (1996), Boewono et al. (1997a), Fryauff et al. (2002), Kirnowardoyo et al. (1985), Machsoes (1939), Maekawa et al. (2009b), Nurdin et al. (2003), Schuurman and Huinink (1929), Soekirno et al. (1997), Soesilo (1935), Stoops et al. (2009b), Sundararaman et al. (1957), Swellengrebel and Rodenwaldt (1932) and Venhuis (1941).

An. umbrosus: Bosh (1925), Doorenbos (1927, 1931), Kirnowardoyo et al. (1991), Mangkoewinoto (1919), Overbeek and Stoker (1938), Swellengrebel and Rodenwaldt (1932) and Takken et al. (1990).

An. vagus: Barodji et al. (2007), Boesri (1994b), Boesri and Boewono (2006), Boewono and Nalim (1996), Boewono and Ristiyanto (2005), Doorenbos (1927, 1931), Hoedjo (1992, 1995), Kirnowardoyo et al. (1985), Lestari et al. (2007), Lien et al. (1975), Maekawa et al. (2009b), Marwoto et al. (1992a), Nurdin et al. (2003), Soekirno et al. (1997), Soesilo (1935), Stoops et al. (2009b), Swellengrebel and Rodenwaldt (1932), Venhuis (1941), Wiganti et al. (2010) and Wigati et al. (2006).