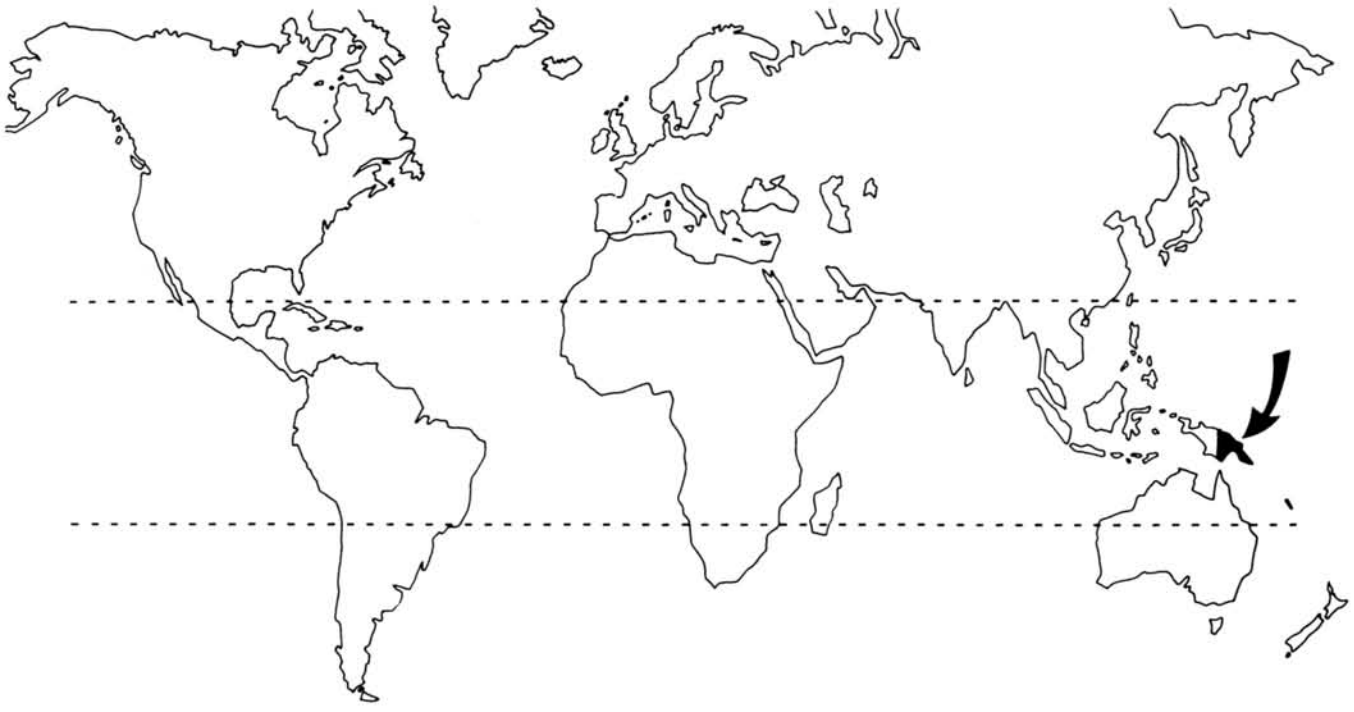

INTRODUCTION AND SPREAD OF HONEYBEES IN MAINLAND PAPUA NEW GUINEA

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Original Contribution

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Two articles by C.D. Michener (11a,11b) on Apis mellifera in Papua New Guinea were published in 1963. This paper complements them and includes further information on the introduction and spread of honeybees in mainland PNG and describes initial developments in commercial beekeeping. The details were mainly obtained by personal communication with beekeepers and others and by personal observations. The map in Fig. 1 show the locations of places named, and Table 1 lists their environmental characteristics.

Introduction and Spread of Apis mellifera

For an area of such ecological diversity, Papua New Guinea has a rather meagre bee fauna. No indigenous Apis species have been recorded, the nearest being in Java and Indonesia, to the west. The only indigenous members of the Apidae family present are those belonging to the tribe Meliponini and genus Trigona, consisting of small, dark, stingless honeybees which live in large colonies. They are represented in Papua New Guinea by the subgenera Plebeia and Tetragona. These have been exploited traditionally through hunting for wax and honey.

The earliest recorded introduction of Apis mellifera was in September 1948, when two colonies of Italian stock were established at Aiyura Agricultural Experimental Station in the Eastern Highlands and a third was sent to Goroka.

The colonies at Aiyura flourished and after two years had multiplied to thirty colonies. Swarming was common during warm, sunny periods throughout the year, and from mid-1949 swarms escaped and feral colonies spread in many directions. The honey yield was about 18 kg per hive per annum; honey flows were continuous with peaks about October and March.

In 1953 a colony was flown from Aiyua to Lumi, West Sepik, and carried on a two-day walk into Inebu, where it swarmed frequently and eventually absconded. Another colony of Italian bees was airfreighted from Brisbane to Wewak in 1949.

Although no other introductions were documented at this stage, in 1957 Apis mellifera were observed at a location in the area near where Hon Creek joins the Purari River. Michener suggests that the bees probably spread from Aiyura down the Lamari and Aure Valleys, through terrain characterized by mountain forest and intersecting grassland valleys 3 to 6 km wide. This would be about 160 km, suggesting a movement

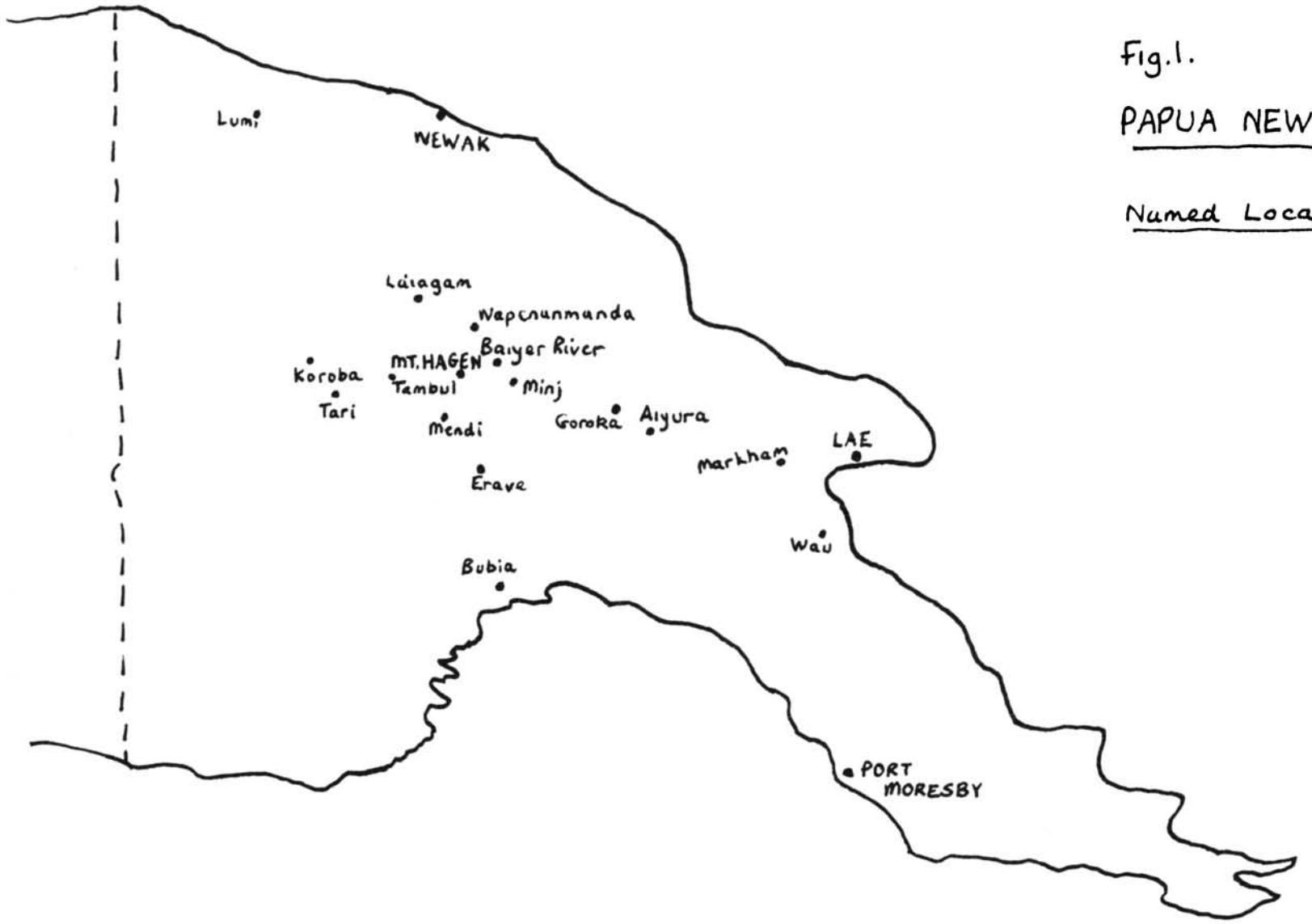

Fig.1.

PAPUA NEW GUINEA

Named Localities

of at least 20 km a year. * Apis mellifera also spread eastwards down the Markham Valley, and by 1959 was reported in the vicinity of Lae and Bubia and in the Wattut Valley near Wau.

It is reported that there were no Apis mellifera in the Southern Highlands before 1955 , when the Methodist Mission arranged for the transport of a colony from Mt. Hagen to Mendi. This colony swarmed frequently and by 1960 twelve colonies were being kept and over half a ton of honey had been produced. During this period two queens were introduced from Hawkesbury Agricultural College in Australia.

By 1959 bees were observed at Kutubu and in January 1960, bees were widely spread throughout the Highlands including Koroba, Wapenamanda and Erave.

Michener reports that several attempts were made to introduce Apis mellifera to the Port Moresby area, but although a few hives were kept successfully for several years, in 1959 there was no evidence of bees. In April 1975 the author observed Apis mellifera collecting pollen (Mimosa spp) near the Viamauri Rive 20 km west of Port Moresby, but there seem to be none in the immediate vicinity of Port Moresby.

Apis mellifera has shown its ability to adapt to a wide range of habitats in mainland Papua New Guinea. The bees nest in trees and in holes in the ground in the Kandep-Laiagam area, characterized by montane forest, native gardens and secondary regrowth. In Tambul the colonies inhabit the hollows of large tree trunks in montane forest, and in Mount Hagen they occupy roofs and walls of buildings in areas of Miscanthus floridulus grassland. At Vaimauri they inhabit areas of disturbed lowland rain-forest and young teak forest.

There is considerable variation in the success of these colonies. Brood taken from a feral colony near Tari in 1974, for example, showed signs of starvation, whereas a wild colony at the Baiyer River Baptist Mission (Kumbaweta) had ample honey stores in the same year. In 1974 about 18 kg of honey was extracted from a colony in secondary regrowth near Kuare in the Kagua subprovince, and in 1975, Mr. John Swincer extracted similar quantities of honey from wild colonies established in the walls and roofs of buildings on the outskirts of Mount Hagen town, and colonies at Kuk Tea Research Station yielded similarly.

Developments In Commercial Beekeeping

Until recently honey production was almost entirely by expatriates, especially missionaries and school teachers, for home consumption. In the late 1950s the Mendi Methodist Mission produced over half a ton for sale. About 3.2 kg was sold (in powdered milk tins) for 10 shillings (K 0.33 per kg); (K= 1 PNG Kina. = US$ 1.25 in March 1977). In the 1970s prices were higher, up to K1.65 per kg. in 1976.

In the Mount Hagen area a few colonies were kept by hobbyists when in 1974 Mr. John Swincer began setting up trials in selected parts of the Western Highlands to determine the feasibility of establishing commercial beekeeping as part of a

* Rates of spread are not necessarily considered to be uniform and need further investigation

Sampling honey in the Western Highlands of Papua New Guinea.

Extracting honey by centrifuge in Papua New Guinea.

programme of the PNG Government Department of Business Development. Wild colonies from buildings were used, and in 1975 seventy colonies were established in different environments throughout the Western Highlands.

During 1972 Fowke estimates that in the Goroka area 2,000 pounds (909 kg) of honey were sold at an average of 35c per pound (75c per kg) to individuals, to the Bird of Paradise Sanctuary at Baiyer River, to the Highlands Tobacco Factory, and to Kabiufa High School and the Hagen Health Food Shop both of which retailed it to the public. The above amount, together with that used for personal consumption and given to friends totalled about 2,400 pounds (1,090 kgs) from 16 productive hives indicating an average annual yield of 150 pounds (68 kg) per hive.

In January 1973 Janco Ltd of Japan submitted to the Director of D.A.S.F. a proposal to establish beekeeping trials in Papua New Guinea in a joint venture with Nisshin Honey Company of Japan. The agreement was that Nisshin Honey Company would provide some management services and funds for day-to-day operations, from their office in Port Moresby. The joint company was to be known as Bunging Pty. Ltd. In June negotiations began between Janco Ltd and Fowke over the purchase of bees and equipment and in August 1973 a representative of Nisshin Honey Co. arrived in Goroka to being operations. Forty-five hives were bought locally and established at the DASF extension centre at Fimito. In addition eleven colonies were obtained from Kabiufa and established at Lapegu forestry station near Goroka. In November a technical school graduate, was employed and given brief training.

However the Japanese venture is presently in abeyance, leaving about 130 colonies on various sites around the Goroka area.

During 1975 the hives were supervised by the PNG Department of Business Development in an effort to expand the project, the colonies in the Western Highlands being left under the supervision of a trainee.

During 1976 this trainee has undertaken several modest enterprises with his six colonies at Kend near Mount Hagen. In August 1976 two technicians were selected to do five months further training in beekeeping with the South Australian Department of Agriculture, sponsored by the Australian Development Assistance Agency.

In the meantime negotiations had begun between the PNG and New Zealand Governments to commence a bilateral aid programme of research into beekeeping potential in PNG. Goroka has been chosen as the location for trials, because of its apparent high beekeeping potential, its central position, existing facilities and Apis mellifera stock.

In October 1976 a New Zealand apiarist arrived in PNG, and since then 200 colonies have been split into 500 colonies to receive 500 Italian queens from New Zealand. Trial hives have also been established in coastal areas such as Port Moresby.

Discussions

In Papua New Guinea's villages the demand for consumer goods is rising, as are the costs of community obligations such as taxes. Thus with the move of PNG to independence on 16 September 1975, the need to generate revenue locally became more essential, and one way of achieving this is to encourage the development of small-scale rural-based industries.

Honey production is one such possibility. If the trials under way shows that honey production in PNG is likely to be economically viable, it could reduce expenditure on honey imports (average K 58,000 per annum) and provide a source of local revenue on a smallholder basis without large cash investment.

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(A fuller report by the author can be consulted at the IBRA library.)

KEY TO VEGETATION TYPES IN TABLE 1

G Gardens - Staple crop is sweet potato (Ipomoea batatas). Sugar cane, local green vegetables, taro (Colocasia), cabbages, bananas (Musa), often under the shade of Casuarina trees.[a]

GR Garden regrowth - Weed growth in gardens varies considerably, depending upon the initial conditions of the site and on subsequent factors such as access of pigs. Common pioneer herbs include Polygonum, Amaranthus, Wahlenbergia, Cynoglossum, Sida, as well as many Compositae such as Crassocephalum, Erctites, Bidens and Sigesbeckia. By the second or third year of fallow, the plot is ususally dominated by sword grass (Mixcanthus floridulus). [a]

IG Induced grassland - Result on the original vegetation of long term interference through clearing, burning and gardening. Four main types dominated by Capillipedium parviflorum, Themeda australis, Ischaemum polyestachyum and Imperatea cylindrica.

LHF Lowland hill forest - Characterized by very mixed composition, with many hardwood species of the mixed tropical families Meliaceae, Sapindaceae, Sapotatceae, and Leguminosae.[b]

LMF Lower montane forest - Dominated by oaks (Castanopsis) and beeches (Nothofagus) and, increasingly, conifer species.[b]

SG, SR Sword grass and shrub regrowth - Tall grasses dominated by sword grass (Miscanthus floridulus), generally mixing with regenerating trees and shrubs especially Antidesma, Agapetes, Acalypha, Callicarpa Dodonaea, Ficus, Grevillea, Glochidion, Macaranga, Osbeckia, Rhododendron Schefflera, Schuurmansia and Wendlandia.

SPF Sago palm forest - Dominated by Campnosperma coriacea.

Sources

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b. Perry, R. et al. (1965) Lands of the Wabag-Tari Area Papua New Guinea. Land Research Series No. 15 C.S.I.R.O., Australia.

TABLE 1

ENVIRONMENTAL CHARACTERISTICS OF NAMED LOCALITIES

LOCATION	ALTITUDE (m)	MEAN ANNUAL RAINFALL (mm)	MEAN ANNUAL SUNSHINE	AVERAGE ANNUAL INDEX % REL	MEAN ANNUAL TEMPERATURE	DOMINANT VEGETATION (See Key)
				0900, 1500	Max Min	
Aiyura	1570	2156	1688	79 , 73	24.1 , 13.2	IG
Baiyer River	1175	2614	-	-	28.3 , 15.6	SG, SR, LMF
Bosavi	259	-	-	-	- , -	LMF
Bubia	15	3025	1911	84 , 75	32.3 , 21.6	LHF, IG
Erave	1035	3405	-	-	26.3 , 13.9	LHF
Goroka	1565	1921	1764	85 , 57	25.7 , 14.6	IG, G, GR
Kagua	1554	3080	-	-	- , -	SG, SR, G, GR
Kandep	2316	2246	-	-	- , -	SG, SR, G, GR
Koroba	1676	3331	-	-	- , -	SG, SR, G, GR
Kutubu	810	4735	-	85 , 74	28.5 , 18.1	SPF, LHF
Lae	15	4617	2012	82 , 71	29.7 , 22.9	IG, SR
Laiagam	2134	2162	-	-	- , -	SG, SR, G, GR
Lumi	535	2646	-	89 , 78	27.4 , 20.2	SPF, coconut plantation GR
Markham (Erap)	260	1248	-	81 , -	32.8 , 21.7	IG
Mendi	1675	2800	-	79 , 75	23.5 , 12.7	SG,SR,LMF,G,GR
Minj	1565	2485	-	-	25.2 , 13.8	IG, G, GR
Mt. Hagen	1630	2586	-	87 , 67	23.7 , 13.0	IG, SR, G, GR
Port Moresby	35	995	2478	77 , 67	31.0 , 22.6	Eucalyptus savanna
Tambul	2241	2617	1292	-	- , -	SG, SR, G, GR
Tari	1600	2693	-	82 , 72	23.9 , 13.1	SG, SR, G, GR
Vaimauri River	10	-	-	-	- , -	LHF, planted teak
Wapenanmanda	1768	2488	-	-	- , -	SG, SR, G, GR
Wattut (Wau)	1065	1843	-	81 , 62	28.0 , 16.4	SG, Sr, LMF
Wewak	5	2219	-	82 , 75	30.3 , 23.0	LHF, GR,coconut plantation

-: no data available

Source of climatic data

MCALPINE, J., KIEG, G, SHORT, K. (1975). Climatic tables for Papua New Guinea. Division of Land Use Research Technical Paper No. 37, C.S. R.O., Australia.