NEW RECORDINGS OF ANIMAL PARASITES IN PAPUA AND NEW GUINEA.

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ABSTRACT.

An addendum to The Distribution of Infectious and Parasitic diseases of Animals in Papua and New Guinea 1964 *is presented.*

A total of forty (40) *new animal parasite recordings are included, as well as new host and regional isolations for those previously reported.*

A brief history is given of the possible origin of parasites exotic to Australian livestock, as well as observations on some of them.

INTRODUCTION.

The following list of parasites is an addition to the host-parasite check list published by Egerton and Rothwell (1964).

For convenience the format of the original publication is adhered to as closely as possible.

The list includes all parasitic organisms identified since that year, as well as necessary changes in the distribution list for parasites previously reported.

An interesting features of a number of the parasites present in domestic animals in this Territory is that they have not, to date, been reported from the Australian mainland.

The majority of parasitic organisms infecting livestock in this country have been introduced from the Australian states with importations of farm animals, particularly in the period before the second world war. A number of economically important helminth and arthropod parasites, however, were almost certainly introduced from the Philippines, Malaya and the East Indies with sporadic introductions of livestock during the early part of this century.

During the era of German administration of New Guinea (1884-1914), Water buffalo (*Bubalis* sp.), Fallow deer (*Dama* sp.) and some Asian Zebu breeds of cattle were imported from the East Indies to the plantations of the mainland and the New Guinea Islands region.

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The date of introduction of the Rusa deer (*Cervus timoriensis mollucensis*), to Netherlands New Guinea is uncertain, but is thought to have occurred early in this century. These animals have adapted to the wet coastal environment of southern Papua remarkably well and have spread from Merauke eastwards to the Fly River in large numbers. A small group of these animals, introduced to the Port Moresby area some decades ago, have managed to perpetuate themselves in the swampy hinterland despite intensive hunting.

The introduction of pigs probably occurred with prehistoric migrations from South West Asia ; carbon dating of pig bones recently excavated from the highland areas suggest that this animal formed part of the diet of indigenous races as long as 5,500 years ago (White 1968). Importations of pigs to coastal areas has also occurred with European exploration and occupation in recent centuries.

Poultry were probably also introduced with early migrations directly from South East Asia. Their small body size renders them easily transportable and it is certain that considerable exchange of birds has been carried on in villages near the West Irian border. Consequently a number of intestinal parasites of poultry recorded from the West Sepik and Western Districts have not been yet observed in other areas of the Territory.

It is evident from the preceding data that ample opportunity existed for the introduction to New Guinea of parasites exotic to the Australian livestock population. Examples of such

parasites may be found in poultry, pigs, dogs, cats and cattle throughout the Territory.

Some of the parasites tabulated below were recorded during a series of surveys carried out on village-owned pigs and poultry in various areas of the Territory; others were identified during routine post-mortem examination of material presented to the Veterinary Laboratory at Kila Kila, Port Moresby.

HOST CHECK LIST OF NEWLY RECORDED ANIMAL PARASITES 1964-1968.

HORSE—*Equus caballus*
- NEMATODA : *Tridontophorus tenuicollis.*
- ACARINA : *Amblyomma cyprium cyprium.*
  Ixodes confusus.
- DIPTERA : *Gastrophilus haemorrhoidalis.*

OX—*Bos taurus.*
- PROTOZOA : *Eperythrozoon spp.*
- TREMATODA : *Ceylonocotyle streptocoelium.*
- CESTODA : *Moniezia benedeni.*
- NEMATODA : *Onchocerca gutturosa.*
- ACARINA : *Haemaphysalis bancrofti.*
- PHTHIRAPTERA : *Damalinia bovis.*
  Linognathus vituli.

PIG—*Sus papuensis.*
- PROTOZOA : *Balantidium coli.*
- NEMATODA : *Globocephalus longemucronatus.*
  Gnathostoma doloresi.
  Strongyloides ransomi.
- ACARINA : *Amblyomma cyprium cyprium.*
  Demodex spp.
  Haemaphysalis papuana papuana.

GOAT—*Capra hircus.*
- SIPHONAPTERA : *Ctenocephalides felis felis.*

DOG—*Canis familiaris.*
- PROTOZOA : *Babesia canis.*
- CESTODA : *Taenia hydatigena.*
- NEMATODA : *Ancylostoma braziliense.*
- ACARINA : *Haemaphysalis papuana papuana.*
- DIPTERA : *Chrysomyia megacephala.*

CAT—*Felis domesticus.*
- TREMATODA : *Euparadistomum sp.*
- CESTODA : *Joyeuxiella pasquelei.*
- NEMATODA : *Ancylostoma tubaeformae.*
- ACARINA : *Haemaphysalis novaeguineae.*
  Ixodes spp.

MOUSE—*Mus musculus.*
- CESTODA : *Hymenolepis diminuta.*
- NEMATODA : *Syphacia obvelata.*
- ACARINA : *Myocoptes musculinus.*

RAT—*Rattus norvegicus.*
- NEMATODA : *Gongylonema spp.*
- ANCANTHOCEPHALA : *Moniliformis moniliformis.*

BUFFALO—*Bubalis spp.*
- DIPTERA : *Siphona exigua.*

DEER—*Cervus timoriensis mollucensis.*
- ACARINA : *Haemaphysalis novaeguineae.*
- DIPTERA : *Chrysomyia bezziana.*

WALLABY—*Wallabia sp.*
- ACARINA : *Haemaphysalis bancrofti.*

GUINEA PIG—*Cavia porcellus.*
- ACARINA : *Ornithonyssus bacoti.*

FOWL—*Gallus gallus*
- CESTODA : *Amoebataenia sphenoides.*
- NEMATODA : *Capillaria anatis.*
  C. contorta.
  Heterakis putaustralis.
- ACANTHOCEPHALA : *Mediorrhynchus gallinarum.*
- ACARINA : *Speleognathopsis galli.*
- PHTHIRAPTERA : *Eomanacanthus stramineus.*
  Lipeuris heterographus.

DUCK—*Anas boschas domestica.*
- NEMATODA : *Ascaridia galli.*
- ACARINA : *Megninia spp.*

PIGEON—*Goura sp.*
- NEMATODA : *Ascaridia spp.*

CORMORANT—*Phallacrocorax sp.*
Contracaecum spiculigerum.

MAGPIE GOOSE—*Anseranas semipalmata.*
- PHTHIRAPTERA : *Acidoproctus hilli.*
  Holomenapon goliath.

EGRET—*Egretta Garzetta.*
- TREMATODA : *Clinostomum complanatum.*

REGIONAL DISTRIBUTION OF ANIMAL PARASITES 1964-1968.

The Territory of Papua and New Guinea has been divided into three regions as follows :—

Papua (PAP)—The Territory of Papua ;

New Guinea Mainland (NGM)—The north-eastern portion of the mainland of New Guinea ; and

New Guinea Islands (NGI)—Manus Island, New Ireland, New Britain, Bougainville and other lesser islands.

The New Guinea Mainland and New Guinea Islands together constitute the Trust Territory of New Guinea.

P = Present.

PR = Present but rare.

.... = not recorded.

An asterisk denotes a new parasite recording for the Territory, as well as new host and regional distribution recordings.

PROTOZOA.

Organism.	Host.	PAP.	NGM.	NGI.
Babesia argentina	Cattle	P *	P	....
Babesia canis *	Dog	P	....	....
Balantidium coli *	Pig	P	P	....
Eimeria deblieki	Pig	P	P *	....
Eperythrozoon sp *	Cattle	P	....	....

TREMATODA.

Organism.	Host.	PAP.	NGM.	NGI.
Ceylonocotyle streptocoelium *	Cattle	P	P	....
Clinostomum complanatum *	Egret	P	....	....
Euparadistomum sp *	Cat	PR	....	....

CESTODA.

Organism.	Host.	PAP.	NGM.	NGI.
Amoebataenia sphenoides *	Fowl	P	P	P
Davainia proglottina	Fowl	P *	P	....
Hymenolepis diminuta *	Mouse	P	P	....
Joyeuxiella pasquelei *	Cat	P	....	....
Moniezia benedeni *	Cattle	P	P	....
Taenia hydatigena *	Dog	P	....	....

NEMATODA.

Organism.	Host.	PAP.	NGM.	NGI.
Ancylostoma braziliense	Dog	PR	....	....
Ancylostoma tubaeformae *	Cat	P	....	....
Ascaridia spp.	Pigeon	....	P	....
Capillaria anatis *	Fowl	P	P	P
Ascaridia galli	Duck	....	P	....
Capillaria contorta *	Fowl	....	P	P
Contracaecum spiculigerum *	Cormorant	P	....	....
Globocephalus longemucronatus *	Pig	P	P	P
Gnathostoma doloresi *	Pig	P	P	P
Gongylonema ingluvicola	Fowl	P *	P	P
Heterakis putaustralis *	Fowl	P	P	....
Mecistocirrus digitatus	Cattle	....	P	P *
Onchocerca gutturosa *	Cattle	P	....	....
Oxyspirura mansoni	Fowl	P	P	P *
Parascaris equorum	Horse	P *	P	....
Strongyloides ransomi *	Pig	P	....	....
Syphacia obvelata *	Mouse	P	....	....
Tetrameres spp.	Fowl	P	P	P *
Triodontophorus tenuicollis *	Horse	P	....	....

Regional Distribution of Animal Parasites 1964-1968—*continued.*

ACANTHOCEPHALA.					
Organism.	Host.	PAP.	NGM.	NGI.
Mediorrhynchus gallinarum *	Fowl	P	P	P
Moniliformis moniliformis *	Rat	P	....	....
ACARINA.				
Organism.	Host.	PAP.	NGM.	NGI.
Amblyomma cyprium cyprium	Horse *	....	P	P
	Pig *	P	P	....
Boophilus microplus	Horse	P *	P	P
Cnemidocoptes mutans	Fowl	P	P	P *
Demodex spp.	Pig *	....	P	....
Haemaphysalis bancrofti *	Cattle	....	P	....
	Wallaby	P	....	....
H. novaeguineae	Cat *	....	P	....
	Deer *	P	....	....
H. papuana papuana *	Dog	....	P	....
	Pig	....	P	....
Ixodes spp. (Nymph.)	Cat *	P	....	....
Ixodes confusus	Horse *	P	....	....
Megninia spp.	Duck *	P	....	....
Megninia cubitalis	Fowl	P	P *	P *
Myocoptes musculinus *	Mouse	P	....	....
Ornithonyssus bacoti *	Guinea Pig	P	....	....
Speleognathopsis galli *	Fowl	....	P	....
DIPTERA.				
Organism.	Host.	PAP.	NGM.	NGI.
Chrysomyia bezziana	Deer *	P	....	....
C. megacephala	Dog *	....	....	P
C. rufifacies	Cattle	P	P *	....
Gastrophilus haemorrhoidalis *	Horse	....	P	....
Simulium spp. *		....	P	....
Siphona exigua *	Buffalo *	....	....	P
	Horse	....	P	P *
Stomoxys calcitrans	Cattle	....	P	P *
	Horse	....	P	P *
TABANIDAE.				
Cydistomyia lorentzi *		P	....	....
Dasybasis anomala *		P	....	....
Mesomyia demeijerei *		P	....	....
Tabanus dorsobimaculatus *		P	....	....
T. innotabilis *		P	....	....
SIPHONAPTERA.				
Organism.	Host.	PAP.	NGM.	NGI.
Ctenocephalides felis felis	Goat *	P	....	....
PHTHIRAPTERA.				
Organism.	Host.	PAP.	NGM.	NGI.
Acidoproctus hilli *	Magpie goose	P	....	....
Damalinia bovis *	Cattle	....	P	....
Eomenocanthus stramineus *	Fowl	....	P	....
Goniocotes gallinae	Fowl	P	P *	P *
Heterodoxus longitarsus	Dog	P	P *	
Holomenapon goliath *	Magpie goose	P	....	....
Linognathus vituli *	Cattle	....	P	....
Lipeuris heterographus *	Fowl	P	P	P
Menapon gallinae	Fowl	P	P	P *

A total of 40 new animals parasites have been recorded from Papua New Guinea in the foregoing list. A further 30 organisms, previously recorded in 1964, have been reported from new hosts or regional areas within this Territory.

A number of these parasites were omitted from the 1964 host check list owing to misdiagnosis. A number of examples follow.

Joyeuxiella pasquelei is by far the most common cestode found in the urban cat population, but macroscopically it resembles *Diplylidum caninum* to such a degree that it has always been previously recorded as that parasite.

Miyazaki (1968) in examining specimens of *Gnathostoma* from New Guinea has identified them as *G. doloresi*; previously all had been reported as *G. hispidum*. Examination of specimens from a number of Territory areas would indicate that *G. hispidum* is not present, but complete survey results are not yet available.

Ancylostoma caninum and *A. braziliense* have both previously been reported from cats in Papua and New Guinea. Attention has already been drawn in the literature to the similarity existing between *A. caninum* and *A. tubaeformae* (Fitzsimmons 1961). *A. tubaeformae*, however, is a slightly smaller worm and has longer spicules in the male than has *A. caninum*. Of approximately 150 cats examined post-mortem since 1964, no heavy infestations of this parasite have been reported, nor has any obvious 'hookworm disease' been observed in kittens in the veterinary clinic. The parasite is rarely absent from the mid-small intestine, but has been found to date only as light infestations with no obvious signs of anaemia present in the host. It is to be expected that heavy infections could lead to the death of young cats. During the recent survey neither *A. caninum* nor *A. braziliense* has been observed in this host.

A number of canine parasites, although recorded as being present in this Territory have only been observed in recently imported dogs. The presence of *Trichuris vulpis*, the common whipworm inhabiting the caecum of the dog, has been diagnosed at both Lae and Port Moresby on microscopic examination of faecal smears. Clinical trichuriasis, however, has never been seen to date.

Taeniid cestodes of dogs have rarely been observed at post-mortem examination, the reason being that no close association exists between the host animal and other mammals capable of harbouring the intermediate stage of these parasites. Under Territory conditions, rarely does the situation arise where dogs have access to offal of domestic ruminants.

Since 1965 the quarantine screening of imported dogs has included cestocidal treatment both before and after their arrival in this Territory. Examination of faecal specimens to date has failed to reveal any adult segments of the hydatid tapeworm *Echinococcus granulosus*.

It would seem highly unlikely that either domestic or sylvatic cycles of hydatid disease could establish themselves in Papua and New Guinea. The closest association between dog and intermediate host animal exists in villages where pigs are sometimes killed *en masse* for tribal feasts. In New Guinea village life however, pigs are highly prized and dogs rarely would have an opportunity to ingest infected offal. Up to the present time, only one sterile cyst of *E. granulosus* has been observed in the liver of a cow at post-mortem, within this Territory.

During the past three years intensive surveys have been carried out on helminths of indigenous poultry and pigs, resulting in a number of new parasites having been recorded from both of these animals. *Gongylonema ingluvicola*—previously listed as rare in fowls (Egerton and Rothwell 1964) has now been described from poultry in all three regions of the Territory. As many as thirty worms have been collected from the crops of individual birds examined in the Rabaul area of New Britain. This helminth, however, appears to be of negligible pathogenic significance.

A number of species of *Heterakis*—the caecal worm of poultry—were also collected but their identification is not yet finalised.

During 1965-1966 approximately fifty rats were examined in the Port Moresby area for the presence of lung worm, *Angiostrongylus cantonensis*. Following on previous reports from other Pacific territories (Alicata and Brown 1962, Alicata 1963), it was decided to establish the presence and incidence of this parasite within the Territory owing to its public health significance. None of the animals examined however, were positive for *A. cantonensis*,

although one of the proven molluscan intermediate hosts, *Achatina fulica*, is present in this area.

An extension of this survey to other areas of Papua and New Guinea, and in particular the port towns of Madang, Wewak, Lae and Rabaul is indicated, in order to ascertain definitely whether this parasite is present.

SUMMARY.

An addendum to *The Distribution of Infectious and Parasitic diseases of Animals in Papua and New Guinea* 1964 is presented.

A total of 40 new animal parasite recordings are included, as well as new host and regional isolations for those previously reported.

A brief history is given of the possible origin of parasites exotic to Australian livestock, as well as observations on some of them.

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