

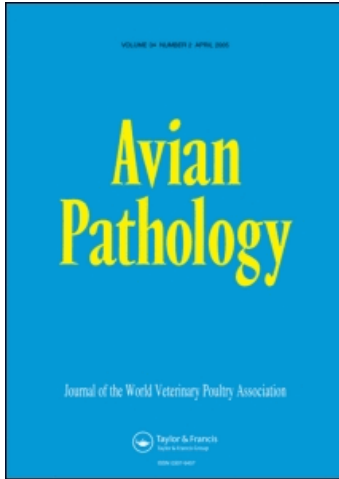
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SHORT COMMUNICATION

**Health studies on the Indian house crow
(*Corvus splendens*)**

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Morogoro, Tanzania*

SUMMARY

Fifteen Indian house crows (*Corvus splendens*) were obtained from a live-trap in Dar es Salaam, Tanzania. Two died soon after arrival. The remainder were examined clinically prior to euthanasia. All birds were examined post-mortem and a limited number of laboratory investigations was performed. None of the birds showed significant clinical signs or pathological lesions. Lice were found on one. Only *Escherichia coli* and *Proteus* spp. were isolated from the rectum. Coccidia were detected in three birds and cestodes in one.

Haematological values were low. No blood parasites were seen. More extensive studies are warranted on the possible role of this species in the dissemination of pathogens.

INTRODUCTION

The Indian house crow, *Corvus splendens* (Vieillot), originated in Asia, but has successfully colonized many other parts of the world ranging from Malaysia to South Africa (Bijlsma & Meininger, 1984). It was first reported in East Africa in 1897 on the island of Zanzibar, to which it was probably intentionally introduced by the British or by immigrants from India.

By the 1950s the Indian house crow had spread to the East African coast and it continues to expand its range. This increase in numbers and distribution has caused concern in Tanzania for a number of reasons. In particular, the authorities consider the species to be an unhygienic and noisy pest, and therefore encourage its control. It has also been suggested that Indian house crows might spread pathogens to domestic livestock or to humans, or both (Ryall & Reid, 1987). More recently, awareness of the possible danger presented to wild birds by introduced pathogens (Cooper, 1989, 1993) has led to speculation that the spread in range of *C. splendens* might lead to the dissemination of micro-organisms that could have an adverse effect on indigenous avifauna. Relevant to this hypothesis is the suggestion that in some areas of East Africa the Indian house crow is ousting the pied crow (*Corvus albus*) (Lewis & Pomeroy, 1989).

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Veterinary studies on the house crow have largely been confined to Asia (see, for example, Duggal *et al.*, 1986; Kyi & Poon, 1987; Sathyanarayana & Tamilarasan, 1989) and have concentrated primarily on metazoan parasites. Biological data are also often lacking, although Manna *et al.* (1986) reported differential leukocyte counts and weights of certain organs in a small number of house crows in India. Weight, wing and culmen measurements have been published for crows in Mauritius (Feare & Mungroo, 1989) and India (Ali & Ripley, 1972). There is a need for more research on the species in East Africa (Manyanza, 1989).

Fifteen live crows, caught in a 'Malaysian' live-trap in Dar es Salaam, were the subjects of this study. They arrived in three baskets at the Faculty of Veterinary Medicine (FVM), Sokoine University of Agriculture (SUA), Morogoro, on 19/2/93. They were placed in a wired enclosure, provided with fresh water and offered a diet of bread and cooked pizza, which they took readily. Two birds appeared weak on arrival and died within 48 h; the other 13 were killed and examined *post mortem* on 23/2/93.

During their time in captivity the crows were observed for clinical signs of ill-health. When handled prior to euthanasia they were examined thoroughly and weighed (to the nearest 5 g) and a wing chord measurement was taken. Following intraperitoneal injection of pentobarbitone sodium, blood was taken from the jugular vein of each bird in lithium heparin, for haematology, and two smears were prepared for direct microscopical examination.

A full postmortem examination was performed. Following gross inspection of internal organs, the complete gastro-intestinal tract, from proventriculus to cloaca, was removed, opened and examined for parasites. Two wet preparations of intestinal mucosa (small and large) were examined microscopically and a rectal swab was taken for aerobic culture on blood agar and selective media. Portions of lung, liver, kidney and intestinal tract were fixed in buffered formalin and histological sections were prepared.

The main findings are summarized in Table 1.

Thirteen of the 15 birds appeared clinically normal on arrival with no evidence at that stage of lesions or ectoparasites. The primaries of one wing had been clipped before receipt at the FVM.

The two birds that died [11 (female) and 12 (male)] showed urate soiling of plumage. *Post mortem* there was no evidence of food in either the crop or proventriculus/gizzard of these two birds, in marked contrast to the 13 remaining crows that were killed 2 days later. Both birds that died were low in weight, one (11) the lightest of the group. Neither contained internal fat.

Ectoparasites (lice) were found in small numbers on the plumage of one crow (13) and there were small numbers of 'fretmarks' (Cooper, 1985) on the feathers of every bird.

None of the 13 birds showed significant gross changes. The pale testes of crow 13 were found to lack melanin, but otherwise to be within normal limits. Histopathological examination of lung, liver and kidney showed minimal infiltration of these tissues by mononuclear cells, but no other changes of note.

Parasites were found in the gastro-intestinal tract of four crows. Three showed

Table 1. Post-mortem findings in fifteen house crows

Sex	Wt (g)	Wing (cm)	Gross findings	G-I tract	Bacteriology	Haematology					
						rbc ($\times 10^{12}/l$)	wbc ($\times 10^3/l$)	PCV (l/l)	Hb (mmol/l)	smears	
1	M	250	26.0	NAD	Food present, NAD, NPS	<i>E coli, Proteus sp.</i>	1.8	2.7	0.38	8.80	NAD, NPS
2	F	200	24.7	Liver damage (injection)	Food present, NAD, NPS	<i>E coli, Proteus sp.</i>	3.5	11	0.47	9.48	NAD, NPS
3	F	190	24.5	NAD	Food present, NAD, NPS	<i>E coli, Proteus sp.</i>	1.1	3.8	I	4.16	NAD, NPS
4	M	230	24.8	Liver damage (injection)	Food present, NAD, NPS	<i>E coli, Proteus sp.</i>	1.5	5.3	I	6.71	NAD, NPS
5	M	200	25.4	Liver damage (injection)	Food present, NAD, NPS	<i>E coli, Proteus sp.</i>	1.2	13	0.24	7.17	NAD, NPS
6	F	230	24.4	NAD	Food present, NAD, NPS	<i>E coli, Proteus sp.</i>	2.1	7.8	0.21	7.40	NAD, NPS
7	F	230	24.9	NAD	Food present, NAD, NPS	<i>E coli, Proteus sp.</i>	2.1	4.7	I	I	NAD, NPS
8	M	225	24.7	NAD	Oocysts, food present, NAD	<i>E coli, Proteus sp.</i>	1.8	4.2	I	6.47	NAD, NPS
9	M	250	26.1	NAD	Oocysts, food present, NAD	<i>E coli, Proteus sp.</i>	I	I	I	4.16	NAD, NPS
10	M	265	27.1	NAD	Oocysts, food present, NAD	<i>E coli, Proteus sp.</i>	1.8	I	I	7.70	NAD, NPS
11	F	140	23.9	Thin, soiled plumage	No food present, NAD NPS	<i>E. coli</i>			N/A		NAD, NPS
12	M	180	26.3	As above	As above	<i>E coli, Proteus sp.</i>			N/A		NAD, NPS
13	M	225	25.6	Pale testes, lice	Food present, NAD, NPS	<i>E coli, Proteus sp.</i>	I	I	0.29	I	NAD, NPS
14	M	170	25.3	NAD	Food present, NAD, NPS	<i>E coli, Proteus sp.</i>	I	I	I	I	NAD, NPS
15	F	165	24.7	NAD	Cestodes	<i>E coli, Proteus sp.</i>	I	I	I	I	NAD, NPS

KEY: NAD = no abnormalities detected; NPS = no parasites seen; M = male; F = female; I = insufficient blood; N/A = not applicable (dead birds).

moderate numbers of coccidial oocysts in both small and large intestine wet preparations and one had cestodes in its small intestine.

One bird (11) yielded only *Escherichia coli* from the rectum: *E. coli* and a *Proteus* sp. were isolated from the other 14 birds.

The 15 birds examined were free of clinical signs of disease other than weakness, attributed to reduced food intake, in the two birds that died. Nor were significant pathological lesions detected, although it is important to note that some organs, e.g. brain, were not examined grossly and only three (lung, liver and kidney) microscopically.

The death of birds 11 and 12 was attributed to inanition. It is interesting to note that in other studies in Tanzania on this species (J. E. Cooper, unpublished) poor condition in trapped crows has been correlated with high levels of coccidial oocysts and changes in the intestine indicative of coccidiosis. That was not the case in the present study.

It proved difficult to obtain adequate volumes of blood, for haematological examination, even if the jugular vein was incised. The blood of this species also appeared to clot rapidly—a feature noted in other unpublished studies when samples were taken from the basilic vein of live Indian house crows.

The apparent absence of blood parasites is of interest. *Corvus splendens* is the type host of *Trypanosoma corvi* (Dirie *et al.*, 1990), but the status of the latter in crows in Tanzania appears not to have been investigated. Examination of 79 blood smears of Indian house crows (Kundelya & Cooper, in preparation), part of a larger survey of domestic and free-living birds in Central and Northern Tanzania, also failed to yield any haematozoa.

None of the birds examined yielded *Salmonella* spp. from the rectum. No attempt was made to isolate *Campylobacter* spp., but this is to be remedied in future work. Various studies in other parts of the world have indicated that wild birds may not only harbour *Campylobacter jejuni*, but also play a role in the spread of this organism (Pachen *et al.*, 1988). Maruyama *et al.* (1990) investigated the prevalence of thermophilic campylobacters in two species of crow (*C. leuallantii* and *C. corone*) in Japan and showed that 62.6% of 'seashore crow' samples yielded these bacteria.

It did not prove possible to identify the coccidia, but the cestodes proved to be a *Raillietina* sp.

Further work is needed on the role of the Indian house crow in the dissemination of pathogens of humans and domestic livestock. Paramyxoviruses, in particular PMV 1, the cause of Newcastle disease, might be spread by *C. splendens*. Over 40 years ago, Blount (1949) stated in the context of Newcastle disease in India:

"In many of the earlier outbreaks reports were frequently received that a heavy mortality in crows (*Corvus splendens*) occurred at the same time and place as outbreaks among poultry, but attempts to infect poultry with material from sick crows and vice-versa failed Crows, which are the ubiquitous scavengers in towns and villages, are doubtless an important factor in spread of the disease over comparatively short distances by carrying portions of carcasses from place to place."

Earlier reports from India of 'typical' clinical signs of Newcastle disease and

mortality in 'crows', presumably *C. splendens* (Davis *et al.*, 1971) would add weight to Blount's hypothesis. The virus has been isolated from other species of crow elsewhere in the world, e.g. *C. monedula* in the UK (Keymer, 1961) and *C. brachyrhynchos* in the USA (Pearson & McCann, 1975).

The study reported in this paper involved only 15 birds from one area and a limited number of investigations. Nevertheless, it has thrown some light on this species and appears to be the first study of its kind in Tanzania. Large numbers of culled *C. splendens* are available for examination in Dar es Salaam and elsewhere, and it is hoped that this report will prompt further research on the species.

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RESUME

Etude sanitaire sur des corneilles indiennes (*Corvus splendens*)

Quinze corneilles (*Corvus splendens*) ont été capturées par piégeage à Dar es Salaam en Tanzanie. Deux sont mortes après leur arrivée. Le reste a été examiné cliniquement avant euthanasie. Tous les oiseaux ont été autopsiés et un nombre limité d'examen de laboratoire a été réalisé. Aucun des oiseaux n'a montré de signe clinique évident ou de lésion pathologique. Des poux ont été trouvés sur un sujet. Seuls *Escherichia coli* et *Proteus* spp ont été isolés à partir du rectum. Des coccidies ont été détectées chez trois oiseaux et des cestodes chez un autre. Les valeurs hématologiques étaient faibles. Aucun parasite sanguin n'a été observé. Des études complémentaires sont nécessaires pour justifier le rôle éventuel de cette espèce sur la dissémination des agents pathogènes.

ZUSAMMENFASSUNG

Untersuchungen über den Gesundheitszustand der Indischen Hauskrähe (*Corvus splendens*)

Fünfzehn Indische Hauskrähen (*Corvus splendens*) wurden aus einer Lebendfalle in Daressalam, Tansania, besorgt. Zwei starben bald nach der Ankunft. Der Rest wurde vor der Euthanasie klinisch untersucht. Sämtliche Vögel wurden obduziert, und eine begrenzte Anzahl von Laboruntersuchungen wurde durchgeführt. Keines der Tiere hatte bedeutsame klinische Symptome oder pathologische Veränderungen. Auf einem Vogel wurden Läuse gefunden. Nur *Escherichia coli* und *Proteus* spp. wurden aus dem Rektum isoliert. Kokzidien wurden in drei Vögeln und Cestoden in einem nachgewiesen. Die hämatologischen Werte waren niedrig. Blutparasiten wurden nicht festgestellt. Eingehendere Untersuchungen über die mögliche Rolle dieser Vogelspezies bei der Verbreitung von Krankheitserregern sind gerechtfertigt.

RESUMEN

Estudios realizados en el cloel (*Corvus splendens*)

Se obtuvieron 15 cloeles (*Corvus splendens*) mediante trampas en la localidad de Dar es Salaam, Tanzania. Dos aves murieron poco después de obtenerlas. Las restantes no presentaron signos clínicos durante el estudio. Todas las aves fueron necropsiadas y se realizó un número limitado de estudios laboratoriales. Ninguna de las aves mostró síntomas o lesiones. Un ave tenía piojos. De muestras del recto sólo se aisló *Escherichia coli* y *Proteus* spp. Se detectaron coccidios en tres aves y cestodos en una. Los valores sanguíneos fueron bajos. No se observaron parásitos hemáticos. Es necesario realizar estudios más profundos para determinar el papel de estas especies en la transmisión de agentes etiológicos.