Competition in Terms of Habitat Preference Between the Two Ectoparasitic Members of Order Phthiraptera

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Abstract: The present study was carried out to investigate the habitat preference of ectoparasites (*Myrsidea invadens* and *Brueelia chayanh*) on Common Myna (*Acridotheres tristis*). 144 Common Myna (*Acridotheres tristis*) were examined round the year (2009-2010) for the collection of two ectoparasitic species *Myrsidea invadens* and *Brueelia chayanh* belonging to the order Phthiraptera from the host *Acridotheris tristis* from Faisalabad City. It was observed that *Myrsidea invadens* (54.7%) was found to be as most common ectoparasite round the year on Common Myna (*Acriditheris tristis*) of Faisalabad city and *Brueelia chayanh* (45.2%) was second most numerous species found on *Acriditheris tristis*. Ectoparasites of different species when found on same host are usually negatively correlated in terms of their habitat preferences. The present study of habitat preferences of two species (*Myrsidea invadens* and *Brueelia chayanh*) showed that these two species specifically avoided interspecific competition as most *Myrsidea invadens* were collected from dorsal side of the examined birds and *Brueelia chayanh* from the ventral side/area of the birds moreover body shapes of ectoparasites are directly related to their habitat as it was observed during the study that *Myrsidea invadens* has rounded body with bigger legs so it prefers dorsal part of its host body and *Brueelia chayanh* has elongated body shape so it prefers the ventral side of the host.

Key words: *Myrsidea invadens* · *Brueelia chayanh* · Phthiraptera · *Acridotheres tristis*

INTRODUCTION

Common Myna (*Acriditheres tristis*) is a native bird of South Asia including Pakistan. Common Myna is an important pollinator or seed-dispersal agent for many plants and trees of biological importance [1]. Common Myna can cause severe damage to ripening fruit, especially grapes, but also to figs, apples, pears, strawberries, blueberries, guava, mangoes etc. Cereal crops of immense importance such as maize, wheat and rice are susceptible to Common Myna [2].

Common Myna is helpful in pest control practices in agricultural areas example on the Hawaiian Islands, it helps to control populations of cutworms (*Spodoptera mauritia*). Common Myna was introduced into the cane fields of Australia to control insect pests such as plague locusts and cane beetles and the idea was found to be successful [1, 3].

Parasites play an important role in every aspect of bird biology, they have the ability to affect the overall health of their host by causing direct and indirect losses which will make the bird (host) weak.

Present study was carried out to report competition among the ectoparasitic fauna (*Myrsidea invadens* and *Brueelia chayanh*) in terms of habitat preference on host body (Common Myna) from Faisalabad, Pakistan. This kind of study is relatively neglected so far in Faisalabad, Pakistan. Present study will give baseline information about the competition among ectoparasitic fauna of Common Myna and will also give potential idea about the threat of ectoparasites by representing their presence on their host.

MATERIALS AND METHODS

Specimen Collection: Live (wild) Common Myna was procured from a local supplier of Faisalabad. Wild caught birds were used to collect ectoparasites after being brought them to laboratory.

Collection of Ectoparasites: Each Common Myna was visually inspected and samples of ectoparasites were taken randomly from each bird’s dorsal, ventral and
underwing by using 4X lens, comb, fine forceps and light source for the detection, collection and full count of ectoparasites.

**Preservation of Ectoparasites**: Ectoparasites were preserved in 70% Ethanol.

**Preparation of Permanent Slides**: For the preparation of permanent slides following procedure was adopted.

- Each specimen of ectoparasite was killed with chloroform then it was fixed in absolute alcohol and was washed in tap water.
- Specimens were dehydrated with 30%, 50% and 70% Ethanol and was stained with eosin.
- Further each specimen was de-stained in acid alcohol (0.5% HCl) then specimen was washed in 70% ethanol in case of excessive staining.
- Dehydration was first done in 90% and then in 100% ethanol, after dehydration specimen was cleared in clove oil for 5-15 minutes and finally specimen was mounted in Canada balsam for examination.

**Identification of Ectoparasites**: Identification of ectoparasites were based on key by Hopkins, Clay and Borror, White and Kellogg, Champman [4-6].

### RESULTS AND DISCUSSION

Parasites play a practical role in every aspect of the biology of birds. The parasites have the ability to affect bird fitness and they can also play major part in population regulation. For example birds weakened by disease may become more vulnerable to predation [7, 8].

In the present study, total 144 birds of Common Myna were examined for the collection of ectoparasites. Among 144 birds 69 inspected birds were male and 75 were females. All birds were adult no juvenile was considered for this study. The data collection span for this study was from March 2009 to February 2010. Total 144 Common Myna were observed out of which 122 Common Myna (both male and female) were found to be infected with ectoparasites (both male and female Common Myna).

Common Myna acts as host for various parasites including species of Mallophaga; Amblycera *Myrsidea spp.* [6] and Ischnocera, *Brueelia chayanh* [9] coexist on the body of Common Myna. 83.41% specimens of Common Myna were found infested with one to four species of Mallophaga [10].

### Table 1: Phthirapteran species found on examined Common Myna and their percent presence

<table>
<thead>
<tr>
<th>Class</th>
<th>Order</th>
<th>Family</th>
<th>Species</th>
<th>% Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insecta</td>
<td>Phthiraptera</td>
<td>Menoponidae</td>
<td><em>Myrsidea invadens</em></td>
<td>54.7</td>
</tr>
<tr>
<td>Insecta</td>
<td>Phthiraptera</td>
<td>Philopterida</td>
<td><em>Brueelia chayanh</em></td>
<td>45.2</td>
</tr>
</tbody>
</table>

During the present study both *Myrsidea invadens* and *Brueelia chayanh* were found to coexist on the body Common Myna.

Percent presense of two different ectoparasites found on Common Myna of Faisalabad vicinity has been shown in Table 1. *Myrsidea invadens* having 54.7% was most common and *Brueelia chayanh* with 45.2% prevalence was second most common ectoparasite found in twelve months of the study. The prevalence of phthirapteran species infesting Common Myna was previously recorded in the district of Rampur, India [11].

It was found that *Myrsidea invadens* was negatively correlated with the presence of *Brueelia chayanh* i.e. from November 2009 to March 2010 percent presence of *Brueelia chayanh* excels but later on during April-October intensity of *Myrsidea invadens* increases. This clearly showed that according to these results the intensity of *Brueelia chayanh* is negative with the intensity of *Myrsidea invadens* (Fig 1 and 2).

Habitat preferences of ectoparasites was also among *Myrsidea invadens* and *Brueelia chayanh* and it was observed that *Myrsidea invadens* preferred dorsal
area of bird and was mostly found at dorsal area of Common Myna *Brueelia chayanh* preferred ventral area and was mostly found at ventral side of Common Myna.

It was previously reported among Hill Mynas of Thailand that these two species *Myrsidea invadens* and *Brueelia chayanh* avoided the competition in terms of habitats of feeding and reproduction. The dorsal part of bird is more suitable for *Myrsidea invadens* but *Brueelia chayanh* prefers to inhibit in ventral side of the body of Common Myna. This phenomenon of competition was explained by size and morphological differences between the two species (*Brueelia chayanh* and *Myrsidea invadens*). The shape of *Myrsidea invadens* was rather round but the shape of *Brueelia chayanh* was reported to be elongated. Moreover it was observed that *Myrsidea invadens* has longer and bigger legs as comparable to *Brueelia chayanh*. Because of the above stated differences *Myrsidea invadens* select dorsal part of the bird body for habitat due to gravity because it can cling firmly with its round shape and strong legs. *Brueelia chayanh* has thin and elongated body which is suitable to be at the ventral area of bird especially at the time when birds fly and expose to the wind [12].

During the present study maximum/greater number of *Myrsidea invadens* were collected from dorsal side of the specimens and *Brueelia chayanh* were collected mostly from ventral side of the body of the observed specimens. So the above statement was found to be significant in *Myrsidea invadens* and *Brueelia chayanh* in Common Myna of Faisalabad region. The shape of *Myrsidea invadens* was somewhat rounded with longer and bigger legs than *Brueelia chayanh* and *Brueelia chayanh* has elongated shape (Fig 5 and 6) and due to difference in body shape *Myrsidea invadens* prefer dorsal part for habitat and *Brueelia chayanh* prefers ventral portion or part of the bird body.

Habitat preferences between two species i.e. *Myrsidea invadens* and *Brueelia chayanh* revealed that the prevalence and the number of *Myrsidea invadens* was negatively correlated with the number of *Brueelia chayanh* found on the examined birds [12]. The present study confirmed the findings that dorsal part is preferable to *Myrsidea invadens* as it negative to the *Brueelia chayanh* presence.

**CONCLUSION**

Present study was done to find out the habitat preferences and competition of two member of ectoparasites belonged to the order Phthiraptera.
(Myrsidea invadens and Brueelia chayanh) on Common Myna from Faisalabad. It was found that the dorsal part of bird was preferred by the Myrsidea invadens and ventral side was preferred by Brueelia chayanh and their presence was negative with each other or they avoid competition with each other.

REFERENCES