

Incrimination of vector species *An.fluviatilis* in Tarai region of Uttarakhand (India)

Dr. C.P.Singh,

Asst. Prof. Zoology, Govt. Degree College Churiyala (Haridwar Uttarakhand India)

ABSTRACT: The results of dissection of female Anopheline mosquitoes in selected localities and numbers found positive for gut/Gland infection. It is clear that present study two specimens of *An.fluviatilis* were found positive i.e.one gland and two gut infections about 3.05% out of 62 specimen dissected.

INTRODUCTION

Christopher (1933) recorded Perry's detection in 1914 as 4% gland infection in *An. fluviatilis* in Jeypore hill tract. Consequently, Parida (1991) recorded this species as a vector of malaria in said region. The other workers who considered *An. fluviatilis* as vector of Malaria are Choudhary *et.al.* (1983) from Gadarpur (uttarakhand). Nagpal and Sharma (1986) from Orissa. Kulkarni(1990) Bruce-Chwatt (1991), Tyagi *et.al* (1992) Sharma *et al.*(1996) ,Shukla *et.al.*(1996,1998) from Nainital Uttarakhand, Mahesh *et.ai* (1997) Incriminated *An.fluviatilis* as a vector of malaria from foot hills of Garhwal region Uttarakhand . Later on Sharma *et.al* (1999) Sharma V.P. (2001), Shukla *et.al* (2002), Ranjit, M.R (2006) Sharma *et.al* (2006), Nanda *et.al* (2012) Incriminated such vector species from different parts of India.

MATERIAL AND METHODS

(A) EXAMINATION OF OOCYSTS IN THE STOMACH;

The live specimens of female Anopheline mosquitoes were killed with petroleum ether for dissection to study whether the mosquitoes carries infection of malaria parasite. First of all trimmed mosquito was placed on a microscopic slide with the apex of the abdomen to the right. With the help of the dissecting needles the abdomen was separated from the thorax. The malpighian tubes were detached immediately and the stomach was transferred to a clean slide followed by addition of a drop of 0.7% physiological saline solution. Thereafter, the stomach was observed under a microscope after covering by a cover slip.

(B) EXAMINATION OF SALIVARY GLANDS FOR SPOOROZOITES;

After killing the mosquito as it was done for stomach dissection, it was placed with the head on the right side. The needle of the left hand side was placed or inserted into the muscle of the thorax just below the region where the glands lie and the head was cut off with the right needle. A gentle pressure was applied to the thorax with the right needle in order to express the gland from the thorax. Soon after this, the right needle was dipped in to the saline and bring it into contact with the gland. As a result the salivary gland was separated and they were either placed on the same slide away from the dissected part or placed on the other slide. Then a coverslip was placed on the separated glands and examined under the microscope for sporozoites. For staining the procedure as adopted by Choudhury and Ghosh (1983) was followed.

RESULTS AND DISCUSSION;

The results of dissection of female Anopheline mosquitoes in selected localities and numbers found positive for gut/Gland infection are given in Table01, It is clear that present study two specimens of *An.fluviatilis* were found positive i.e.one gland and two gut infections about 3.05% out of 62 specimen dissected.

Vector incrimination is a pre-requisite for understanding malaria situations and for planning and evaluating malaria control particularly when numerous Anopheline species co-exist. The results of present study revealed that *An.fluviatilis* was found positive for gut and gland infection in Tarai belt of kumaun Uttarakhand. In the past James (1902), Perry (1914), Covell (1927), Rao (1941), Bhatiya *et.al* (1957), Nagpal and Sharma (1985,1986), Gunasekran *et.al* (1989), Kulkarni (1990), Tyagi (1992), Sharma *et.al* (1996), Nanda *et.al.* (2012) Considered *An.fluviatilis* as vector of primary importance. There are a number of workers who have considered different species of Anopheles to act as a vector of Tarai belt.

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TABLE 01. - Showing number of female Anopheline mosquitoes dissected at Tarai region of Uttarakhand during the period from August, 2014 to July 2015.

Mosquito species	Average collected	Abdominal conditions				Dissection		Positive		Sporozoite Rate %
		UF	FF	SG	G	Gland	Gut	Gland	Gut	
<i>An. subpictus</i>	98	35	27	30	06	65	65	-	-	-
<i>An. stephensi</i>	50	20	13	15	02	38	38	-	-	-
<i>An. fluviatilis</i>	75	38	17	10	10	62	62	01	02	3.05
<i>An. culicifacies</i>	90	40	13	30	07	85	85	-	-	-
<i>An. aconitus</i>	26	12	08	06	-	21	21	-	-	-
<i>An. splendidus</i>	32	15	10	05	02	28	28	-	-	-
<i>An. annularis</i>	20	14	02	02	02	05	05	-	-	-
<i>An. vagus</i>	07	01	-	05	01	01	01	-	-	-
<i>An. maculatus</i>	30	12	08	05	05	12	12	-	-	-
<i>An. gigas</i>	02	-	01	-	01	-	-	-	-	-

- UF – Unfed; FF – Fully fed; SG – Semigravid; G - Gravid