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Fast communication Design of indigenous bat trapping device

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Abstract- Emergence and re-emergence of viruses is a complex suite of many factors including but not limited to host, virus and environment. Bat-borne arboviral infections respiratory infections comprise the three main categories of emerging viral infection in India presenting challenges to the health security. A skew of these diseases towards the zoonotic pathogens exacerbated the surveillance in reservoirs. This entails targeted bat surveillance programmed for early warning thus reducing the risk of emergence. Traditional methods used for trapping the bat possess inherent limitations in usefulness. In the current communication we describe the design of a bat trapping assembly indigenously developed, user friendly and cost effective.
Keywords – Novel bat trap, emerging viruses, surveillance

I. INTRODUCTION

Past few years have witnessed emergence and re-emergence of many viruses of public health importance causing devastating effects in India. Bats have acquired considerable notoriety for being associated with plentiful of emerging infectious diseases (EIDs). They serve as reservoirs for viruses from many families including Filoviruses (Ebola), Paramyxoviruses (Nipah, Hendra), Coronaviruses (SARS and MERS-CoV), Reoviruses (Melaka) as well as various Lyssaviruses. The disease transmission for these viruses can be directly from bats to human beings due to their unique ability of vagility and aggregation, through wild life- livestock interface or through companion animal hosts, Extreme geo-climatic diversity present in India poses the country to a constant threat of emerging and reemerging viral infections of public health importance (Mourya et al., 2019). Bat surveillance for emerging infectious diseases has led to the identification/isolation of variety viruses in different bat species globally. Prioritizing and strengthening the countrywide surveillance of EID in bats was essential give early warning in case of any spill over events that would in-turn guide the public health policies / strategies and emergency preparedness. Through this surveillance two novel viruses Malsoor virus-family Bunyaviridae, genus, Phlebovirus (Mourya et al., 2014) and a novel adenovirus- family, Adenoviridae genus, Mastadenovirus (Raut et al., 2014) were reported from Rousettus bats for the first time in India. Additionally, Tioman a Paramyxovirus (Yadav et al., 2016) was also identified for the first time in the country. Considering the priority for the protection of public health and global economies, bat research and surveillance has been initiated over the past few years (Phelps et al., 2019). Bats are nocturnal aerial predators with a capacity of powerful flight and often use echolocation (Hayman, 2016) that makes the process of bat trapping difficult. Traditional methods used for trapping the bat include shooting, cage traps, mist netting traps suspended between two poles and erecting these together in the forest, have inherent limitations in usefulness. The height at which the bats fly is influenced by many biotic and abiotic factors that include vegetation height, wind speed, migration routes of other species and insect concentrations (Roemer, 2017). Endemic zoonoses is relatively neglected due to lack of appropriate traps for bat surveillance.

II. PROPOSED ALGORITHM

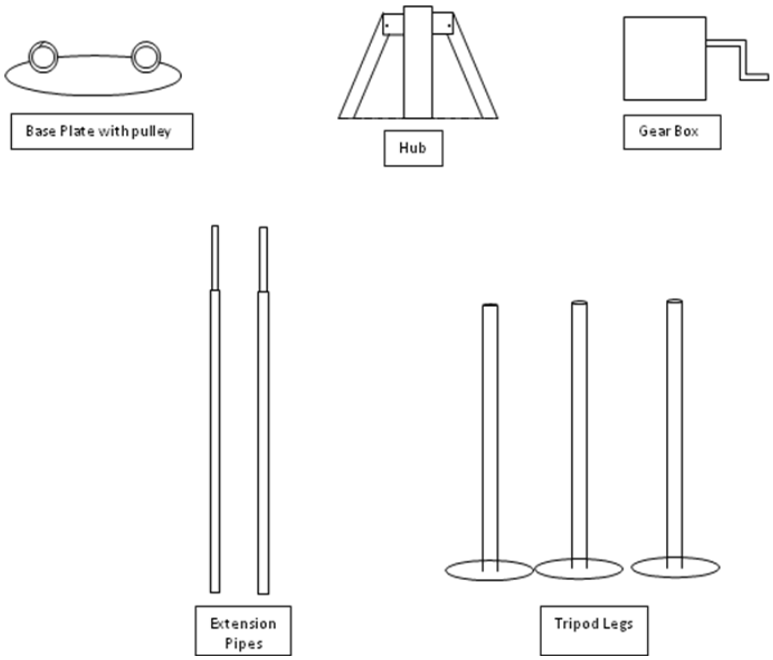
All these issues underscored the development of a cost-effective, field-appropriate assembly for bat trap on priority. In the current communication we describe the design of a bat trapping assembly indigenously developed at ICMR-National Institute of Virology, Pune Maharashtra.

III. EXPERIMENT AND RESULT

The assembly consists of following five parts (Fig 1, 2.1 and 2.2)

1. Base plate with pulley
2. Hub
3. Gear box

4. Extension pipes
5. Tripod legs



Fig; 1 Accessories for the assembly

The tripod stand used in the assembly is approximately 7' in height, which can be used for pole lifting arrangement. The tripod has extendable legs for carrying purpose and its height can be reduced or increased as per requirement. The tripod legs can be fixed to the ground with the help of bolt, to restrict its movement, as shown in image (Figure: 2.3). Winch and wire rope arrangement is used to insert the pipes into the tripod to increase the height of bat trap (Figure: 2.4 and 2.5). A second tripod with a similar arrangement having equal height as of the first tripod has to be assembled in parallel. A net can be connected in between these two tripods with the help of clips (Figure: 2.6).

2.1. Tripod & extension pipes

2.2. Winch, base plate with pulley, bolts

2.3. Fixed the tripod legs

2.4. Locked tripod legs

2.5. Winch fixing arrangement

2.6. Assembly with support ropes and net

Fig 2 Accessories required for bat trap arrangement

3.1 Advantages of the assembly

The present description and the experiences with this bat trap satisfy the criteria of lesser intrusion, independence from electric power (additional attribute on the field sites), less laborious, ease of carrying, cost effective and none

the less the safety. The height o f the assembly can be increase up to 40-50 feet as per the requirements using the extension poles.

IV. CONCLUSION

The world has become a global village where EIDs can travel long distances in a day. They have a negative socio-economic impact due their ability to jeopardize the public health, international trade as well as tourism and food security. A multi-disciplinary approach combining the expertise can be put together; to offer an excellent opportunity to study this relationship between the humans, wild life and the entire biotope intersect. Although bats are reservoirs of important viruses like Nipah, Hendra, Rabies, Lyssaviruses their agricultural and ecological importance of bats in the ecosystem for pollination and dispersion of seeds cannot be over looked. Complex issues associated with one health approach can be solved utilizing the newer technologies that can be cognizant with the repercussions in bat conservation as well as public and animal health safeguard.

V. REFERENCE

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