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## Comparative efficacy of *peste des petits ruminants* (PPR) vaccines

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### ABSTRACT

*Peste des petits ruminants* (PPR) is a highly contagious, economically important viral disease of sheep and goats with high morbidity and mortality rates. In order to control the disease effectively, highly sensitive diagnostic tests coupled with potent vaccines are important pre-requisites. At present, there are three live attenuated PPR vaccines available in India including Sungri 96, Arasur 87 and Coimbatore 97. Indian Veterinary Research Institute (IVRI) Mukteswar developed the PPR Sungri 96 (isolate of goat origin) vaccine; while Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) developed the Arasur 87 (isolate of sheep origin) and Coimbatore 97 (isolate of goat origin). In this study, the potency of these vaccines including a fourth vaccine from Institute of Animal Health and Veterinary Biologicals, Bangalore (IAH&VB) were tested as per the office International des Epizooties (OIE) guidelines by challenge studies in sheep and goats and their efficacies were evaluated using PPR C-ELISA. Potency tests of these vaccines in sheep and goats revealed that three of the vaccines were potent; however, the IAH & VB vaccine was comparatively less potent. The three vaccines could presumably be used for mass vaccination of both sheep and goats while contemplating PPR control program.

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### 1. Introduction

*Peste des petits ruminants* (PPR) is a highly contagious and economically important viral disease of sheep and goats characterized by pyrexia, mucopurulent nasal and ocular discharges, necrotizing and erosive stomatitis, enteritis and pneumonia with morbidity and mortality as high as 90% and 100%, respectively [1]. The disease was first reported in West Africa during 1942 [2] and later found in Senegal [3], Central Africa [4], Sudan [5], India [6], East Africa [7], Arabia [1], Middle East [8], Ethiopia [9] Bangladesh, Pakistan, Nepal, Israel and Saudi Arabia [10–12]. The disease is now enzootic in several African and Asian countries including India [13] and is an obstacle in the small ruminant productivity and adversely affects the livelihood of marginal and small farmers as well as landless labourers as sheep and goat are reared in India by primarily the poor and economically downtrodden sectors of the farming community [14].

The disease is caused by an RNA virus, *peste des petits ruminants* virus (PPRV), in the genus *Morbillivirus* of *paramyxoviridae* family

[15]. PPRV is antigenically closely related to rinderpest virus (RPV) [16,17]. Other members of the *Morbillivirus* genus are human measles virus (MV), canine distemper virus (CDV), phocine distemper virus (PDV), dolphin morbillivirus (DMV) and porpoise morbillivirus (PMV) [18]. Molecular epidemiology of PPRV based on 'F' gene sequence from all over the world has defined the existence of four different lineages of virus (I–IV), of which lineage IV is prevalent in India and other lineages are prevalent in African and other countries [11]. Lineage I is present in West Africa, lineage II in Nigeria and Cameroon, lineage III in East Africa and lineage IV in Asia. However, recently there was an incursion of lineage IV virus into Africa, this was identified following a large epizootic in Morocco [19,20]. Based on the partial F gene sequencing, there is a solitary report of lineage III PPRV occurrence in southern India [10]. However, since then there has been no further report of this lineage. Analysis based on the 'F' gene of PPRV isolates from India reveals that all the isolates belong to lineage IV [11].

For the control of PPR, four attenuated live cell culture vaccines are available commercially. The first vaccine was developed by attenuating PPRV Nigeria 75/1 isolate by Diallo et al. [21], which belongs to Lineage I and is being used for protecting sheep and goats in African countries. The second vaccine, Sungri 96, was

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