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ROLE OF PHEROMONES IN MAMMALS

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Pheromone is a summation of two words, phero (derives from Ancient Greek word) meaning “to bear” or “to carry” and horman, “to excite”. Ethologist Karl von Frisch called pheromone with the name "alarm substances". Pheromones are the combination of chemical substances secreted or excreted from the individual that triggers a response in members of the same species. They are capable of acting like hormones outside the body therefore, also classified as ecto-hormones. Pheromones of the secreting individual can impact the behaviour of the receiving individuals. The former is termed as a signalling pheromone, while the latter is a releasing pheromone. Pheromones have been mostly studied in insects and dearth in the respect of mammals because their complex behaviour and insufficient knowledge of the chemical communication of mechanism. The role of pheromones in mammals is also very appreciable by seeing previous studies. Pheromones are present in various forms on the basis of their mode of action.

TYPES OF PHEROMONES

- Communication pheromones (species specific)
- Alarm pheromones
- Food trail pheromones
- Sex pheromones
- Behavioural pheromones (maternal, territorial, aggressive etc)
- Physiological pheromones

LOCATION OF SECRETION

Apocrine sweat glands which are supplied with adrenergic sympathetic postganglionic fibres secretes a viscous fluid that may contain pheromones in the body of animals.

EFFECT IN MAMMALS

CATTLE: Pheromones are important smell signals to find a sexual partner during the estrous cycle in cattle. The Jacobson's organ (vomeronasal organ), a part of the olfactory system is a major receptor site for pheromones in the animals.

DOG: Androstenone is a pheromone produced by pigs but acts as a powerful interomone in the dog. Androstenone causes dogs that are barking/jumping in an excited state to immediately stop barking through the olfactory system. It also stops dogs from begging and generally declines their furiosity. Therefore, behaviour modification using pheromones can improve animal welfare by reducing the incidence of unsolicited barking and jumping behaviours in dogs. Also, rabbit pheromone (1 ug/mL) has an effect on dog heart rate and behavior. It reduces heart rate of nervous dogs and increases heart rate of overly calm dogs. However, anxious dogs did not respond uniformly to all types of pheromones.



PIG: The testes of male pig (boar) secrete huge amounts of compounds known as C-16 unsaturated androgens. These androgens play role as a pheromone, 5- α -Androst-16-en-3-one (androstenone) when they are excreted in boar saliva. These pheromones cause the sow in heat or estrous to adopt the mating posture. This typical instance reveals the lordosis behaviour of the sow.

HORSE: The pig pheromone, androstenone also causes a calming consequence on horses. Horses that are “head shy” will struggle the human hand touching their head. This makes it problematic to put on a halter or bridle. One shot of androstenone (1 ug/mL) to the nostril of a head shy horse will make it soother. The handler will be able to place a halter or bridle on the animal. Other applications include horses that are afraid of trailers or other novel environments, pheromones plays an effective part in dealing these conditions.

RABBIT: The rabbit maternal pheromone 2-Methylbut-2-enal secreted after the kindling, aids neonatal rabbits in finding their mother. This pheromone also supports them in attaching to the maternal nipple.

RODENTS: In mammals these pheromones not only serve as an agent of simple attraction but can also regulate some more complex processes of reproduction. In order Rodentia, the sequence of the ovarian cycle is influenced by precise components of male and female odour that delay or accelerate the onset of oestrus. In mice pregnancy may be blocked by the effect of the smell of a strange male (Bruce Effect). Olfactory markers are very common among mammals. Such markers presumably serve as signals indicating a territorial claim, and they may also carry information about the individual animals that has a left a mark.

Therefore, we can conclude that pheromones are potentially effective means of monitoring the animal behaviour as it is well proved in insects. These chemical substances accomplish greater heights in the future scientific researches in the field of veterinary science.