Elephant dung shows stress levels

Traces of hormones come through in the dung and indicate this

AATHIRA PERINCHERY

Asian elephant stress levels peak during dry seasons, when resources are low. This is what studying leftover hormones in elephant poop unravels. The method could be an important non-invasive tool to study the health of wild pachyderm populations in India, finds a new study. In the future, it could also help test the efficacy of management interventions introduced to conserve the endangered species.

Habitat loss: The body condition of elephants deteriorate during dry seasons and this reflects in the stress levels. ▪ SPECIAL ARRANGEMENT

With shrinking habitats, India's endangered elephants face food shortages and increased disturbances in their environments. The resulting physiological stress (a result of secretion of stress hormones such as glucocorticoids) can be beneficial for elephants, helping them escape from threats. However, if prolonged, the stress can affect their health, reproduction and even survival. Stress levels are often high in emaciated pachyderms: so can hormones - traces of which come through in elephant dung - be an indicator of elephant health?

Scientists at the Indian Institute of Science, Bengaluru, examined changes in visual body condition scores of 261 elephants in the Mysuru and Nilgiri elephant reserves in south India during wet and dry seasons, scoring their 'body condition' on a scale of one (for very thin pachyderms) to five based on the visibility of bones. They also analysed faecal glucocorticoid metabolite (fGCM) levels in the fresh dung of the elephants they observed, to see if stress hormones were a good indicator of body condition across seasons. To study annual patterns, they repeated this for nine female elephants across seven years.

The findings, published in *Conservation Physiology,* show that the body condition of elephants deteriorated during dry seasons, and has a strong relationship with fGCM levels (especially in females). As body condition deteriorated, stress hormone levels spiked.

"Many conservation studies focuses on how animals behave when they are disturbed, how their population declines or changes. But they forget to address how such changes affect the internal health of an animal. Measuring fGCM will tell us how elephants are affected by either intrinsic or extrinsic factors. Our study is the first to examine this in free-ranging Asian elephants," says doctoral researcher Sanjeeta Sharma Pokharel, lead author of the study.

"The sudden change in the profile of fGCM after any management intervention would definitely indicate the strong association between stress response and management practices," she says.