Study of river otters near oilsands operations shows reduced baculum strength

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A team of researchers affiliated with multiple institutions in Canada has found evidence that suggests river otters living near oil sands operations in Alberta, Canada, have reduced baculum strength. In their paper published in the journal *Chemosphere*, the group describes their study of the baculum (penis bone) in multiple river otter specimens.

As many countries turn away from traditional oil sources to fracking and extraction of oil from tar sands, concerns are rising about the environmental impact in areas around these facilities. In this new effort, the researchers were told by people who owned land close to oil sands operations in Alberta that they had noticed river otter litters were shrinking since the beginning of oil sands. To find out if that was the case, the researchers hired local trappers to catch multiple specimens from sites at varying distances from the oil sands operations. Since prior research had suggested that baculum strength might be impacted by chemicals that make their way into the environment during oil sands operations, the team chose to make it the focus of their study.

The work involved taking CT scans of otters to measure the size and shape of the baculum in vivo. The scans also provided estimates of bone density. In other work, the researchers euthanized the otters and removed their baculum for more in-depth study. The secondary study was focused on measuring baculum strength—to that end, they used devices that could bend the bones until they broke and others that twisted them to the breaking point. The researchers were able to find the level of stiffness of the baculum, the peak load, and work to failure.

In looking at their data, the researchers found that those otters living closer to the oil sands operations had reduced baculum strength compared to those that lived farther away. Interestingly, they also found that otters exposed to other contaminants such as hydrocarbon retene, strontium or iron had baculums that were actually stronger than normal. The researchers suggest that some contaminants from oil sands

operations in the area are likely having a negative impact on otter populations in the region due to reduced baculum strength.

More information: Philippe J. Thomas et al. Co-exposures to trace elements and polycyclic aromatic compounds (PACs) impacts North American river otter (Lontra canadensis) baculum, *Chemosphere* (2020). DOI: 10.1016/j.chemosphere.2020.128920