



A62 The Human Cadaver Decomposition Island and the Vegetation Regrowth Interval

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Learning Overview: After attending this presentation, attendees will have a clear understanding of what a surface human Cadaver Decomposition Island (CDI) looks like with and without scavenging interference and soil chemical composition results obtained throughout the study. Attendees will understand that the CDI is present months after the remains are removed and the concentration of soil nutrients fluctuate during the decomposition process.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by bringing awareness to those entities participating in search and rescue efforts to not only focus on looking for the skeletal remains of an individual but to also look for the CDI and collect soil samples. Both the CDI and soil nutrient composition are useful pieces of evidence.

Typically, during the late phase of the Early stage of human decomposition, fluids of the body, formed during autolysis, hydrolysis, and by other chemical and bacterial actions, leach into the soil under and around the body producing a CDI. The fluid contains high concentrations of organic matter and microorganisms, eradicating any vegetation adjacent to and under the body. When the soil pH and nutrients in the upper soil horizons appear to return to a level similar to the original state, translocated nutrients in the soil cause native vegetation, and flora not indigenous to that area, to flourish. Previous research observing regrowth of vegetation has been conducted using *Sus scrofa*, although no literature to date has recorded the vegetation regrowth of a human CDI.¹

In 2013 and 2018, studies were conducted at the Applied Anatomical Research Center (AARC) in Huntsville, TX. The studies demonstrated that the CDI is greatest under the trunk, reduced under the head, and further reduced under the limbs. The studies documented the timing of the formation of the CDI as well as the timing of the return of vegetation around and within the CDI. In 2013, 16 subjects were placed, and, in 2018, 4 additional subjects were placed with the inclusion of soil sampling throughout the study. For both studies, subjects were in similar environmental conditions. After collapse of body cavities and formation of the CDI, caged subjects were removed from their CDI at predetermined intervals of zero, two, and four weeks after leaching. Cages remained over the CDIs and daily observation occurred until regrowth within the CDI formed. For 2013 subjects removed at zero weeks (the day after CDI formation appeared complete), regrowth within the CDI occurred after 131 days. For 2013 subjects removed at two weeks after CDI formation, regrowth occurred after 197 days. Most of the CDI for subjects accessible to scavenging had formed under the trunk of the body prior to being moved around by scavengers. However, the CDI of the limbs and head could not be clearly identified after movement of the body by scavenging had smeared the soil. Bodies were pulled away from the major part of the CDI by scavengers but remained at the periphery throughout the study. Between 90 and 207 days, vegetation began to appear in the CDIs of scavenged subjects. The trunks of the bodies that had minimal movement by scavenging prolonged the CDI's composition.

Results demonstrate that in the piney woods region of southeast Texas, if a decomposing body can leach the majority of its fluid in an area, prior to extensive scavenging, vegetation regrowth may take approximately 90–200+ days to appear. In search and rescue efforts for missing individuals presumed dead, a CDI may be detectable three to seven months after death even if the body has been displaced from its original location. 2018 study observation and soil chemistry results will be presented at the American Academy of Forensic Sciences (AAFS) meeting in February 2019.

Reference(s):

- ¹ Benninger L.A., Carter D.O., and Forbes S.L. 2008. The Biochemical Alteration of Soil Beneath a Decomposing Carcass. *Forensic Science International*. 180(2-3):70-75.

Forensic Anthropology, Taphonomy, Soil Composition