Detection of human and bovine collagen in early Holocene bone and teeth using an antibody microarray

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Protein was isolated from 0.1 gram of bone and teeth of wombat (*Vombatus ursinus*), woolly mammoth (*Mammuthus sp*.), human (*Homo sapiens*), cow (*Bos taurus*) and pig (*Sus scrofa*) using a standard guanidine hydrochloride extraction technique. The age of the samples ranged from present day to early Holocene. Antibodies specific to human and bovine-specific forms of collagen were then used with enzyme-linked immuno-sorbent assay (ELISA) and antibody (Ab) microarray techniques to detect preserved collagen. Results show that human and bovine-specific forms of collagen were detected in 10 000 year-old human and juvenile bovid bone respectively, from Lake Turkana, Kenya. Detection sensitivity between the two techniques was equivalent, although Ab microarray typically required two orders of magnitude less sample volume (5 µl per array) than ELISA (5 ml per 96-well microtiter plate) and half the time for assay completion (1 hour). CONCLUSION: Ab microarray is a relatively quick and easy technique for the simultaneous detection of multiple proteins when the amount of original sample is limited.