September 15, 2020

Evolution & Behavior

Our ancestors in Africa ate roasted root vegetables 170 thousand years ago

by Lyn Wadley[1] | Honorary Professor; Christine Sievers[1] | Senior Lecturer

[1]: University of the Witwatersrand, Johannesburg, South Africa

This Break was edited by Max Caine, *Editor-in-chief* - TheScienceBreaker

ABSTRACT

We report evidence for the cooking and sharing of root vegetables by early humans from at least 170,000 years ago. Charred Hypoxis rhizomes from Border Cave, South Africa, were identified by comparing the anatomy of ancient and modern rhizomes. Hypoxis occurs widely in sub-Saharan Africa.

Image credits: Pixabay

Almost everyone enjoys roasted root vegetables, and our ancestors were no exception. An archaeological team excavated the remains of starchy rhizomes cooked 170,000 years ago in the Border Cave, South Africa. In total, 55 whole charred rhizomes were recovered from the same species – Hypoxis angustifolia (yellow stars). The ancient rhizomes were identified by comparing their shape and internal anatomy to those of modern ones. This plant grows today in countries on the eastern side of sub-Saharan Africa, and it extends into Yemen. It seems likely that Hypoxis had similar growth patterns in the past and would have provided food security for early travellers within and out of Africa.

Wooden digging sticks or sharpened bones may have been used to harvest Hypoxis. The root vegetables, the size of baby carrots, were carried back to the cave, perhaps wrapped in a hide, or as a bunch secured with leaf-string. Wood was collected for cooking fires that probably burned to hot ash before the root vegetables were added for roasting. Some of these were then lost in the ashes where they became burned and thus preserved for delighted archaeologists. The burning occurred while the

rhizomes were fresh and "green" because the charred specimens display split surfaces from moisture expelled as they were heated. Many root vegetables can be eaten raw, but they are more nutritious when cooked because the human gut can then process the glucose better, absorb more of it and consume higher quantities of starchy food. Cooking would have made the Hypoxis rhizomes easy to peel. It would have rendered them digestible by breaking down fibre as well as releasing the glucose. This food handling was a particularly important aid for the old or very young members of the group that might otherwise have found it challenging to consume the rhizomes. These dependants probably waited at home for food to be brought to them. The fact that food was transported to the cave and then cooked adds to our knowledge of social behaviour and sharing at 170,000 years ago. The food could easily have been cooked on campfires and eaten in the field by the collectors, but it was not. The rhizome discovery consequently provides us with a glimpse of ancient communal behaviour. Then, as now, food would have satisfied hunger but was also the focus for socialising and care-giving.

The Border Cave occupants were modern humans (Homo sapiens) with the same dietary requirements as us. We have large, "expensive" brains that need about 100g of carbohydrate per day to function well. Starchy root vegetables like Hypoxis could satisfy that need. We know that the Border Cave people ate meat and root vegetables because we have recovered the bones of wild animals like buffalo and bushpig that were consumed in the cave. In Africa, game meat lacks fat, especially in the dry season when animals lose condition. Lean meat protein must be supplemented with carbohydrate or fat to enable it to be metabolised by humans (Speth & Spielman 1983). Eating carbohydrate would, therefore, have allowed early humans to process protein effectively. Thus the "real" palaeo-diet combined cooked carbohydrate and protein.

We made several field trips over a period of four years. We collected modern plants with rhizomes to compare them with the Border Cave ones to identify them. With a permit from Ezemvelo KZN Wildlife, we surveyed the hillside near the cave, dug entire plants and created vouchers for a herbarium. When we could not immediately identify a plant, we planted it in Wadley's vegetable garden to await flowering. Eventually, the entire garden was given over to wildflowers. As each was securely identified, its rhizome was charred, examined microscopically, and compared with the Border Cave rhizome. A combination of features (rhizome shape and size, and internal vascular structure) eventually led to the identification of the Border Cave rhizome as Hypoxis. The rhizomes are still used as food (and some less palatable Hypoxis species have medicinal value) but have been overexploited by dense rural populations so that the plants are no longer as common as they may have been in the past. The Border Cave 170,000-year-old find is the earliest identified, cooked root vegetable anywhere in the world and the value of Hypoxis as a source of carbohydrate endures wherever it is able to grow from South to North Africa.