

Dingoes: going to the dogs?

There is more dog to many a dingo than meets the eye, according to the results of a study by the CSIRO Division of Wildlife and Rangelands Research. Before this research on the identity of dingoes began, anecdotal evidence indicated that domestic dogs had been mating with them for years, particularly near agricultural regions in south-eastern Australia.

The dingo's history in Australia goes back 3500 to 4000 years. Scientists speculate that Aboriginal man brought the dingo (*Canis familiaris dingo*) with him from Asia, and that competition from the dingo may have led to the extinction of the native thylacine, or marsupial wolf, in mainland Australia.

Dogs and dingoes belong to the genus *Canis*, which also includes wolves,



Some of the offspring from CSIRO breeding stock: a pure-bred 'black and tan' dingo (the black and tan colouring is rare in the wild); a hybrid bred from two wild dogs caught in central New South Wales; and a dingo-blue heeler cross.



coyotes, and jackals. Domestic dogs (*C. familiaris familiaris*) have, over the period of European settlement on the mainland, literally taken to the hills and become feral. In the Gippsland region of Victoria, dingo-trappers have caught German shepherds, kelpies, collies, border collies, Australian cattle dogs, samoyeds, bull terriers, labradors, and deerhounds.

The trappers also snared dingo-like animals with patchy, spotted, and brindle coats — probable hybrids. Nobody knows for sure just how long

hybridization has been going on and how many of our 'dingoes' are really hybrids. How closely related are dingoes and dogs, anyway? In the mid '70s, other workers conducting experiments on blood enzymes failed to show up any biochemical differences between the two.

Dr Alan Newsome and Dr Laurie Corbett, of the Division of Wildlife and Rangelands Research, together with Ms Sue Carpenter of the Division of Mathematics and Statistics, attempted to resolve the dingo's identity in two steps.



A dingo pup with one of the male dingoes used in the breeding program at Alice Springs, N.T. It was captured in the north-western Northern Territory.

First, they looked at differences in skull structure between domestic dogs and wild dingoes. After they had identified consistent variations in skull morphology, they applied the findings initially to a group of 'known' hybrids that they had bred themselves and then to another group of 'unknowns' from a suspected hybrid zone, Gippsland.

The team began by taking 50 wild dingoes from remote areas in central Australia where there are few, if any, feral domestic dogs and compared these with 43 domestic dogs from the Canberra dog pound. They had chosen domestic dogs similar in size to dingoes, especially breeds kept by farmers and graziers in dingo areas. These included kelpies, blue

heelers, collies, border collies, and their crosses.

They narrowed the number of distinguishing features of dog and dingo skulls down to eight. These basic differences indicated that dingoes had longer muzzles, larger auditory bullae (the hollow bone that houses the inner ear) and main teeth, longer and more slender canine teeth, flatter skulls, and larger nuchal crests (the 'bump' at the back of the skull). All of these features are seen as adaptations to hunting.

In general, skulls from Australian kelpies and their crosses were more like the dingo's than those from other dogs. Dogs showed a much greater variability in their measurements than dingoes and less difference between the sexes.

The choice of skull characters and of the domestic dogs used for comparison may influence ideas about the taxonomic position of dingoes in relation to other wild canines, according to Dr Newsome, Dr Corbett, and Ms Carpenter. Thus, although studies by other researchers had shown that dingo skulls resembled wolf skulls more than the coyote's, the CSIRO team's work indicated the reverse. However, their results suggested that dingoes had a stronger affinity with dogs

than with either wolves or coyotes.

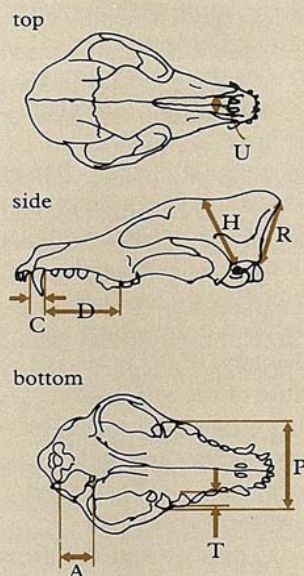
The breeding of hybrids in captivity began in 1967, with five dingo pups caught in outback Central Australia and two other pups from the Adelaide zoo. Those two had been bred from wild dingoes, themselves caught as pups in remote parts of South Australia.

These dingoes were bred with domestic dogs, including blue heelers, a kelpie, a white labrador, a Doberman pinscher, and a beagle. The skulls of the 41 resultant hybrids were measured for those distinguishing features found to be most significant in the skull morphology study. At the same time, 50 'unknown' hybrids, caught in Gippsland, were assessed for their likeness to dingoes, dogs, or the known hybrids.

As expected, based on the final set of skull features, dogs and dingoes fell into two quite distinct groups, with the hybrids' scores intermediate to (but slightly overlapping) them.

This overlapping presented a problem. While the hybrids clearly were not 'dingo' or 'dog', only half the sample of known hybrids lay between outer scores for those two distinct categories. The researchers concluded that we can never be certain of 'the identification of any *C. familiaris* of unknown heritage as a dingo, dog, or hybrid . . . only that

Three views of a canid skull



- U width of upper muzzle bones
- C width of canine tooth
- D distance from back of canine to back of cheek tooth
- H height of skull above ear-hole
- R height of rear of skull
- A length of auditory bulla
- T greatest width of cheek tooth
- P width of hard palate

The eight skull features that provided a composite score for each animal in the hybridization study.

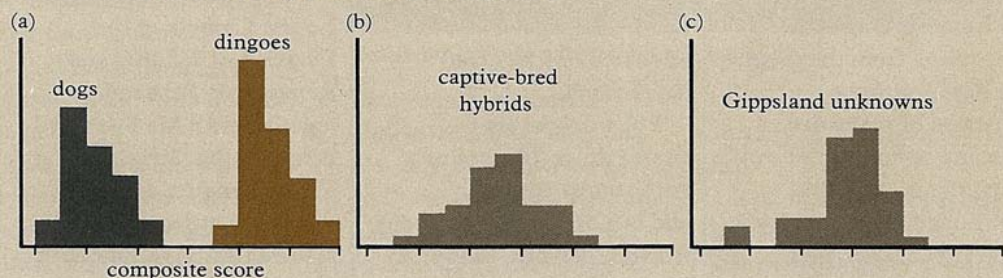
the individual resembles one or other of those groups at a measurable level of probability'.

The animals from Gippsland were also intermediate, but were, on the whole, more dingo-like than the known hybrids. The scientists' measurements identified the sample of unknowns as 12% dogs, 52% hybrids, and 36% dingoes. Dr Newsome and Dr Corbett suggest that the parent dogs of the Gippsland unknowns were larger than most of those used in the breeding experiment.

Similar studies of coyotes, wolves, and domestic dogs in North America have shown that hybridization, sometimes involving a mixture of all three canids,

The composite skull-measurement scores showed: (a) the difference between groups of dogs and dingoes; (b) the intermediate nature of the captive, bred hybrids; and (c) the similarity of the Gippsland unknowns to those hybrids.

Differences between dogs, dingoes, and hybrids



has also occurred there. The red wolf (*C. lupus niger*), in particular, appears to be succumbing to the same method of gradual extinction in the south-eastern part of the United States as the dingo in Australia.

It is ironic that the 'ring-in' carnivore that may have helped wipe out Australia's marsupial wolf may itself be usurped by new blood. Dr Newsome and Dr Corbett concluded from the Gippsland sample of hybrids that 'pure dingoes may become extinct in Gippsland over time unless their fitness exceeds that of hybrids and that of feral dogs'. How long the process will take, or how far it will spread, remains to be seen.

Mary Lou Considine

The identity of the dingo. I.

Morphological discriminants of dingo and dog skulls. A.E.

Newsome, L.K. Corbett, and S.M. Carpenter.

II. Hybridization

with domestic dogs in captivity and in the wild.

A.E. Newsome and L.

Corbett. *Australian Journal of Zoology*, 1980, 28, 615-25; 1982, 30, 365-74.