

Applications:

- Bird Sexing
- Parentage Verification
- Individual Identification for Studbook Registry
- Estimation of Genetic Variation for Breeding Management
- Population / Subspecies Differentiation

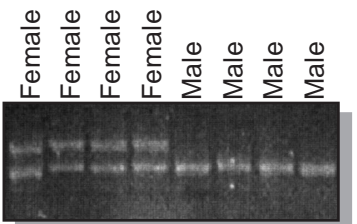
Bird Sexing



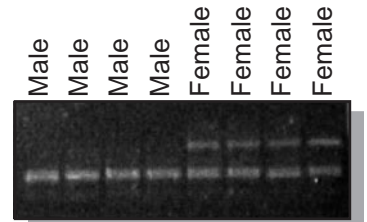
Parrot

In the past, gender determination of sexually monomorphic birds was invasive and stressful for the animal. For the breeder, it was time consuming and expensive. Recent advances in biotechnology have produced a PCR-based test that has been successful for determining sex in most species of birds. The test requires only a drop of blood or plucked feathers and can be

performed at any age. The PCR test is quick and accurate. Female birds are the heterogametic sex and possess ZW sex chromosomes while the male birds possess ZZ sex chromosomes. The PCR primers are designed for a specific region on the W chromosome but will also amplify a similar region on the Z. Since the females possess the two different sex chromosomes, the PCR product will result in two bands, one from each sex chromosome. The male birds on the other hand will have only one band. The two images to the right show the diagnostic bands for distinguishing sex among Green Aracaris and Amazon Parrots.



Green Aracaris



Amazon Parrot

Parentage Verification



Mother
Chick
Sire

In a study of mating/reproductive strategies in scarlet and Waldrapp ibises it was essential to verify parentage of alleged offspring of mated pairs. The autoradiograph at left depicts the DNA profiles of a nesting pair of scarlet ibises and their chick. Note that each genetic marker observed in the DNA profile of the chick can also be observed in the DNA profile of one or both adults thus verifying parentage. No scarlet ibis chicks were found to be the product of an extra pair copulation, however some Waldrapp chicks were "excluded" from being the offspring of the mated pair who's nest they were found in.

Scarlet/Waldrapp Ibises



Scarlet Ibises
(photo courtesy of S. Elbin)

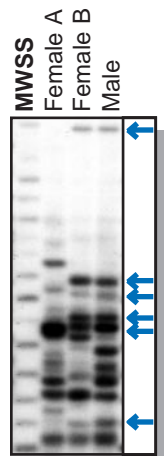
Estimation of Genetic Relatedness



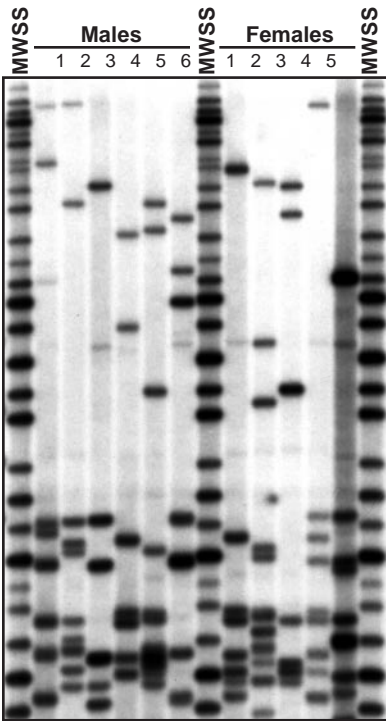
Macaw

A breeder of macaws had recently purchased three young and allegedly unrelated birds (one male and two females) to add to her breeding flock. Since the male and female B were constantly observed together, the breeder wondered whether she should allow these birds to become a mated pair. DNA-profile testing was conducted to determine the relatedness of the three macaws. The DNA profile results in the figure to the right show a high proportion of shared bands or genetic markers (blue arrows) between the male and female B. It was concluded that the male and female B were probably related (possibly siblings) and therefore should not be paired.

Macaws



Estimation of Genetic Relatedness



A rancher who had decided to begin raising emus had purchased several male and female emus to pair together as breeding stock. Since no data concerning the relatedness of the birds had been provided to the rancher, he decided to have DNA profile testing conducted to avoid pairing of related birds. The figure to the left shows the DNA profiles of 11 of the emus tested in the study. All possible male-female pairs were examined genetically to determine relatedness. The genetic similarity within pairs ranged from 28% to 82%, suggesting that some males and females were probably siblings. Using the DNA data, the rancher chose to pair up males and females which showed the least amount of genetic relatedness. By so doing, he avoided inbreeding in his flock and should therefore expect higher egg/chick production.

Emus



Emus

Specimen Requirements

(Please call before shipping **any** samples)

Specimen Type	Volume	Container	Shipping Instructions
Whole Blood containing Nucleated RBC	0.1-2 ml	EDTA Purple Top Vacutainer™	Liquid— overnight on ice packs
Tissue	Call for instructions		
Blood/Feathers for Bird Sexing			

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