

2 Pigeons, Domestication of

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8 Domesticated from the rock pigeon (*Columba*
9 *livia*), the domestic pigeon is an Old World
10 pigeon that, along with over 300 other pigeon
11 and dove species, comprises the family
12 Columbidae, in the order Columbiformes.
13 Although fossil evidence suggests that rock
14 pigeons evolved in Southern Asia, today the nat-
15 ural habitats of the wild rock pigeon are open and
16 semi-open environments across Europe, North
17 Africa, and Western Asia, with a preference for
18 cliffs and rock ledges for breeding. Domestic
19 pigeons, however, and their feral descendants
20 have spread across all permanently inhabited
21 regions of the world.

22 Pigeons exhibit variations in more traits than
23 any other bird species (Price 2002). Although first
24 domesticated as a source of food, the later spread
25 of the chicken diminished their importance and
26 thus most domestication traits present in modern
27 birds were explicitly selected for exhibition, or
28 to improve racing speed and homing ability. As
29 a result, the different breeds show dramatic
30 variations in craniofacial structures, color and
31 pattern of plumage pigmentation, feather place-
32 ment and structure, number and size of axial and

33 appendicular skeletal elements, vocalizations, 33
34 and flight behaviors (Figs. 1 and 2). This variation 34
35 is so great that Charles Darwin, the father of 35
36 modern evolutionary thought, noted that based 36
37 on morphology alone, a taxonomist might be 37
38 tempted to classify different breeds as completely 38
39 different genera (Darwin 1868). Despite their 39
40 remarkable divergence, pigeon breeds are so 40
41 obviously unified in their descent from a single 41
42 ancestral species, that Darwin used them as a key 42
43 example to illustrate his ground-breaking ideas 43
44 about natural selection. In particular, he saw 44
45 pigeons as a striking exemplar of how continual 45
46 selection can lead to significant, and rapid, mor- 46
47 phological and behavioral variations from 47
48 a single ancestral type (Darwin 1859). 48

49 Although pigeons are among the earliest 49
50 domestic birds and one of the earliest domestic 50
51 animals (Hansell 1998), relatively little is known 51
52 about their initial domestication. The rock pigeon 52
53 today consists of many subspecies spread across 53
54 Eurasia and North Africa, but exactly which sub- 54
55 species was the ancestor of domestics, when, 55
56 where, and how many times domestication 56
57 occurred, and how domestics spread over the 57
58 majority of their history are largely unknown. 58
59 Most of the available information comes from 59
60 written accounts rather than archaeological 60
61 remains, probably due to both the problem of 61
62 morphologically discriminating between wild 62
63 rock pigeons and the earliest ferals and domestic 63
64 strains, and their relatively fragile bones, which 64
65 could bias against long-term survival in the 65
66 archaeological record. 66

67 Pigeons are first mentioned in Mesopotamian
 68 records over 5,000 years ago, and are documented
 69 in most subsequent developed cultures of the
 70 region (Johnson & Janiga 1995). The pigeon
 71 played a range of important roles in ancient cul-
 72 tures, including messenger, food, pet, religious
 73 icon, medicine, and navigation aid. We also
 74 know that, in some cultures, the scale of their
 75 domestication was immense – ancient Egyptians
 76 retained massive populations (as they did with
 77 other domesticates such as cats and dogs), sacrific-
 78 ing as many as tens of thousands in single ceremo-
 79 nies. More recently, Akbar of India regularly
 80 traveled with a menagerie of thousands of pigeons.
 81 As with other domesticated animals (e.g., dogs and
 82 cats), interest in fancy breeds increased in the
 83 eighteenth century and continues today.

84 In contrast to the paucity of information about
 85 the earliest phase of their domestication, their
 86 relatively recent interest to breeders and hobby-
 87 ists provides historical accounts that help trace
 88 the origins of modern breeds. Nevertheless, the
 89 diversification of domestic pigeons has received
 90 surprisingly little attention from a genetics per-
 91 spective although recently Stringham et al.
 92 (2012) analyzed microsatellites from a broad
 93 sample of domestic breeds and found that while
 94 it was not possible to recover a well-resolved
 95 phylogeny describing the relationships among
 96 breeds, pigeons can be loosely subdivided into
 97 two ancestral clusters. Furthermore, while
 98 pigeons exhibit substantial genetic differentiation
 99 at the breed level, a phylogeny was difficult to
 100 resolve probably due to the reticular history of
 101 many breeds. As with other domesticates such as
 102 dogs and chickens, pigeon breeds were (and are)
 103 continually hybridized throughout their history in
 104 order to modify or add traits. Each of the two
 105 ancestral clusters encompasses remarkably dif-
 106 ferent morphologies, with the first principally
 107 containing the pouters and croppers, fantails,
 108 and mane pigeons, and the second consisting
 109 predominantly of the tumblers (the most breed
 110 rich group) as well as the owl, wattle, and homing
 111 breeds (the latter containing the modern racing
 112 homer pigeon, which itself is a hybrid of several
 113 ancient breeds).

114 No discussion of domestic pigeons is complete
 115 without mentioning their feral descendants – feral
 116 pigeon populations are found in almost all human
 117 inhabited locations and, in terms of numbers, rep-
 118 resent one of the world’s most successful feral
 119 animals. In North Africa and Western Asia, feral
 120 populations are probably as old as domesticates
 121 themselves. The natural homing response of
 122 pigeons would have enabled domestics to be
 123 released to fly free during the day before returning
 124 to man-made lofts, thus providing plenty of oppor-
 125 tunity for birds to go feral. The extent of this
 126 feralization has been so great, and the opportuni-
 127 ties for hybridization between domestic and free-
 128 living populations so numerous, that truly wild
 129 rock pigeons might be on the verge of genotypic
 130 extinction. The chronic genetic contamination of
 131 wild populations greatly complicates attempts at
 132 resolving exactly when, and where, the original
 133 domestication processes occurred. In other
 134 regions, the feralization is likely contemporaneous
 135 with the introduction of the domestic breeds. For
 136 example, pigeons were introduced ~400 years ago
 137 in North America by European colonizers. In con-
 138 trast to the tremendous morphological variations
 139 observed among pigeon breeds, the morphology of
 140 feral pigeons is remarkably homogenous, with
 141 close similarities to racing breeds. Genetic ana-
 142 lyses of some feral populations support this asso-
 143 ciation, with feral and racing pigeons being only
 144 minimally genetically differentiated (Stringham
 145 et al. 2012). This is not surprising given the wide-
 146 spread global interest in racing pigeons, often over
 147 long distances and with release from locations
 148 unfamiliar to the birds. Racing birds sometimes
 149 do not successfully return to their home lofts, and
 150 those that survive likely add to the feral pigeon
 151 population and gene pool.

Cross-References

- ▶ [Animal Domestication and Pastoralism: Socio-Environmental Contexts](#) 153
- ▶ [Animal Domestication, Archaeozoology of](#) 154
- ▶ [Defining Domestication](#) 155
- ▶ [Genetics of Domestication: Recent Advances](#) 156

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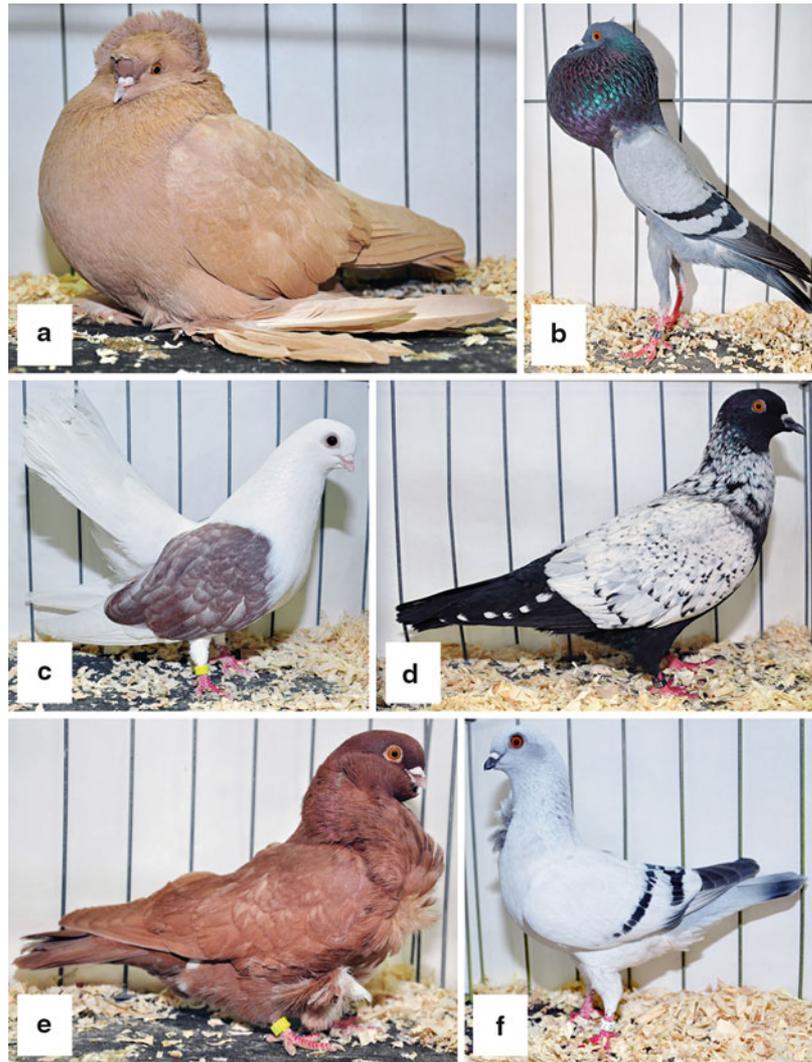
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Uncorrected Proof

Pigeons, Domestication of, Fig. 1 Variations in body shape, posture, and plumage color among domestic pigeon breeds. (a) English trumpeter. (b) Brunner pouter. (c) Taganrog tumbler. (d) Starling. (e) Chinese owl. (f) Italian Owl. (Also see Fig. 2c. Photo credit: M. D. Shapiro)



Unc

Pigeons, Domestication of, Fig. 2

Variations in other traits among domestic pigeon breeds. (a, b) Extreme beak differences between the Scandaroon (a) and Old German owl (b) breeds. The Old German owl also has a crest of reversed feathers on the back of its head, a trait present in many domestic breeds but not in the ancestral rock pigeon. (c) Fantail breed with supernumerary and elevated tail feathers. (d) Cropper breed with a greatly enlarged and inflated crop, an outpocketing of the esophagus. (e, f) Variation in epidermal structures on the lower hind limb of domestic pigeon breeds. Feathers grow from the skin of the tarsus and foot of some breeds (e), while most breeds retain the ancestral trait of scales on the lower limb. (Photo credits: M.D. Shapiro (a and c-f) and S.A. Stringham (b))

