

In ictu oculi

VOLUME 3 BIRDS

(Gruiformes, Otidiformes, Passeriformes, Casuariiformes,
Phoenicopteriformes, Piciformes, Podicipediformes,
Podargiformes)

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Order Gruiformes

Family Gruidae

Blue crane (*Grus paradisea*)

Nictitating membrane blink



Lower lid elevated during preening



Nictitating membrane blink



Brolga (*Antigone rubicunda*)

Nictitating membrane blink



Nictitating membrane blink



*Nictitating membrane blink – looks like being on eye movement
but is on head movement (on the video)*



No lid blink on pecking (cannot exclude a nictitating membrane blink)



Grey crowned crane (*Balearica regulorum*)

Nictitating membrane blink



a) Pre-blink. b) Eye covered by almost opaque nictitating membrane. c) Post-blink after head movement ends.



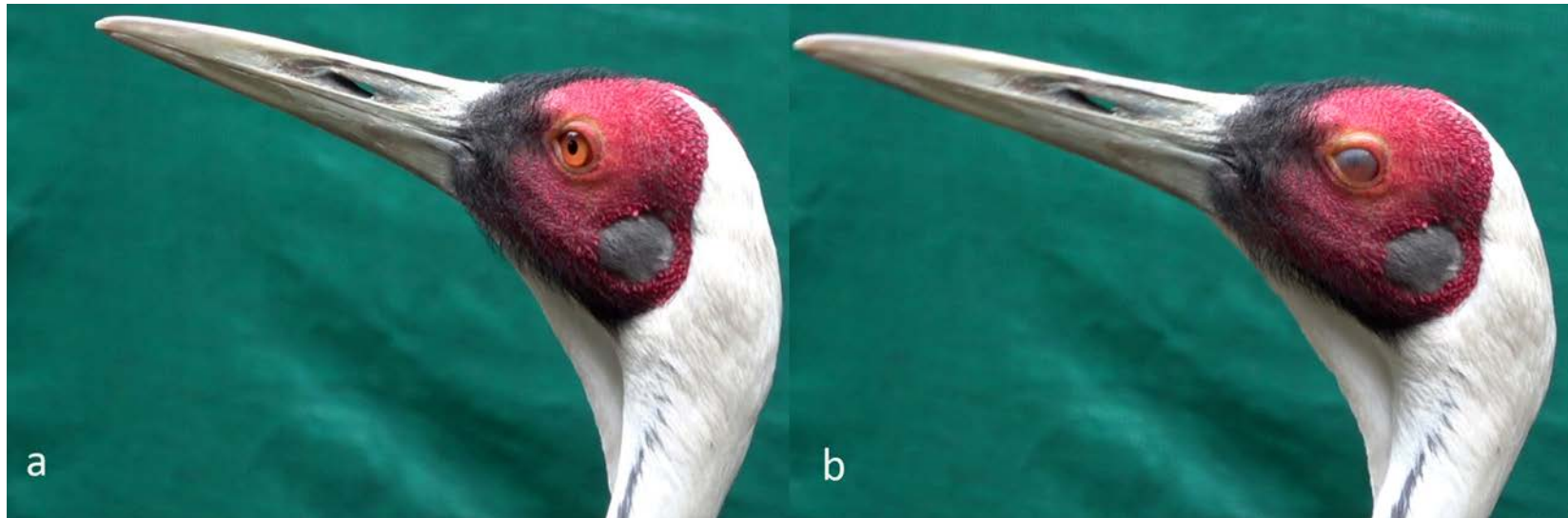
a) Pre-blink. b) Both eyes covered by almost opaque nictitating membrane. c) Post-blink after head movement





White-naped crane (*Antigone vipio*)

Nictitating membrane blink on head turn



a) Pre-blink. b) Translucent nictitating membrane containing visible blood vessels appears on head turn.

Red crowned crane (*Grus japonensis*)

Nictitating membrane blink



Elevation of lower lid with preening



Nictitating membrane and lower lid blink with drowsiness



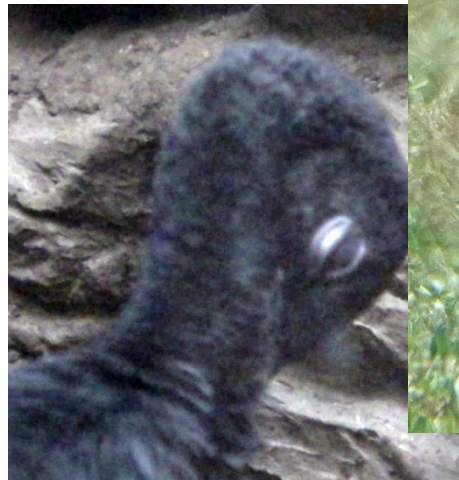
Family Psophiidae

Grey-winged trumpeter (*Psophia crepitans*)

Nictitating membrane blink with lower lid elevation on preening



Nictitating membrane blink on head turn



Family Rallidae

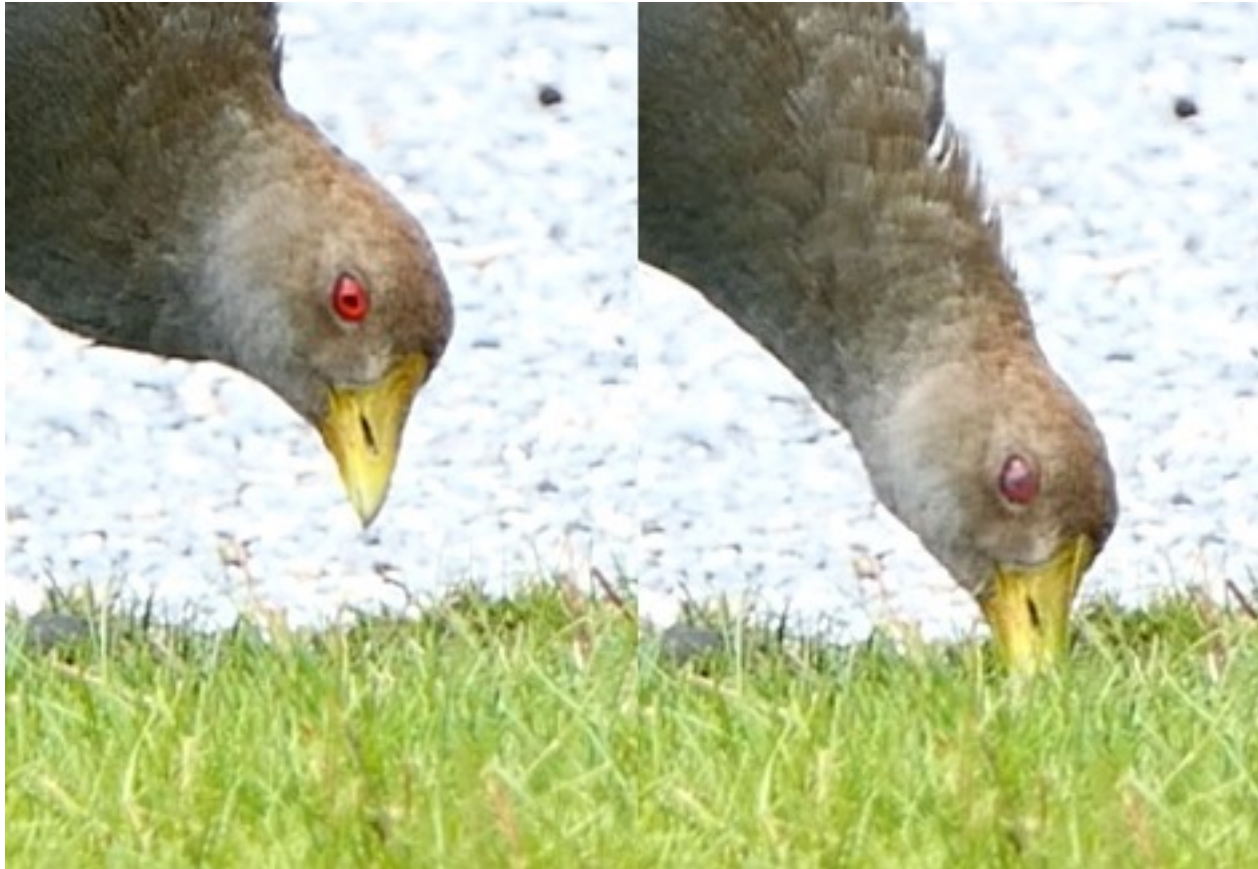
Black-tailed nativehen

(*Tribonyx ventralis*)



Tasmanian nativehen (*Tribonyx mortierii*)

Nictitating membrane blink on pecking but not sustained



Eurasian coot (*Fulica atra*)

Nictitating membrane blink on head turn



No sustained blink on head turn



Lower lid (white) elevated during preening

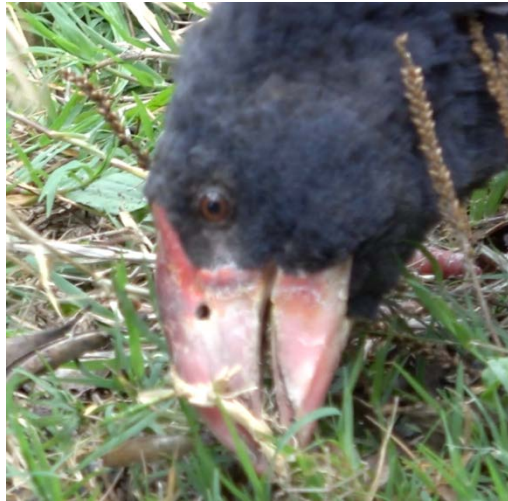


Takahē (*Porphyrio hochstetteri*)

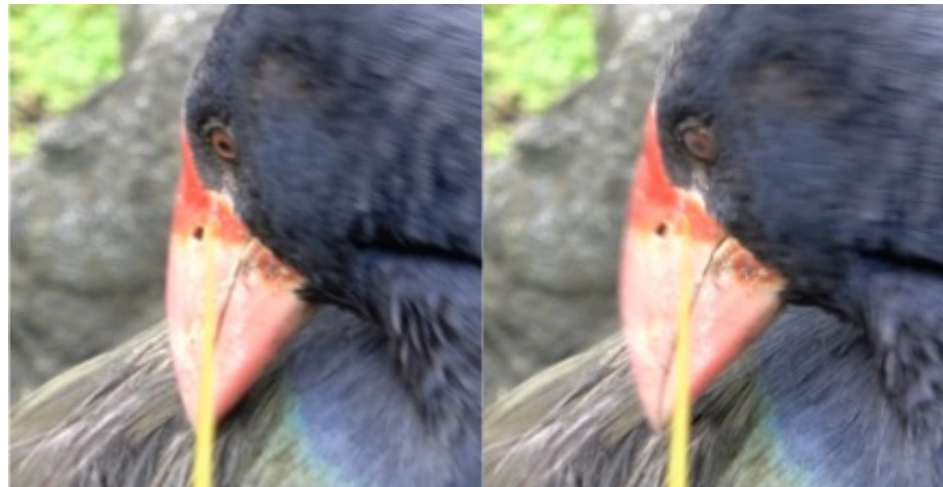
Nictitating membrane blink on head turn



No sustained blinking on pecking



Brief unsustained nictitating membrane blink during preening

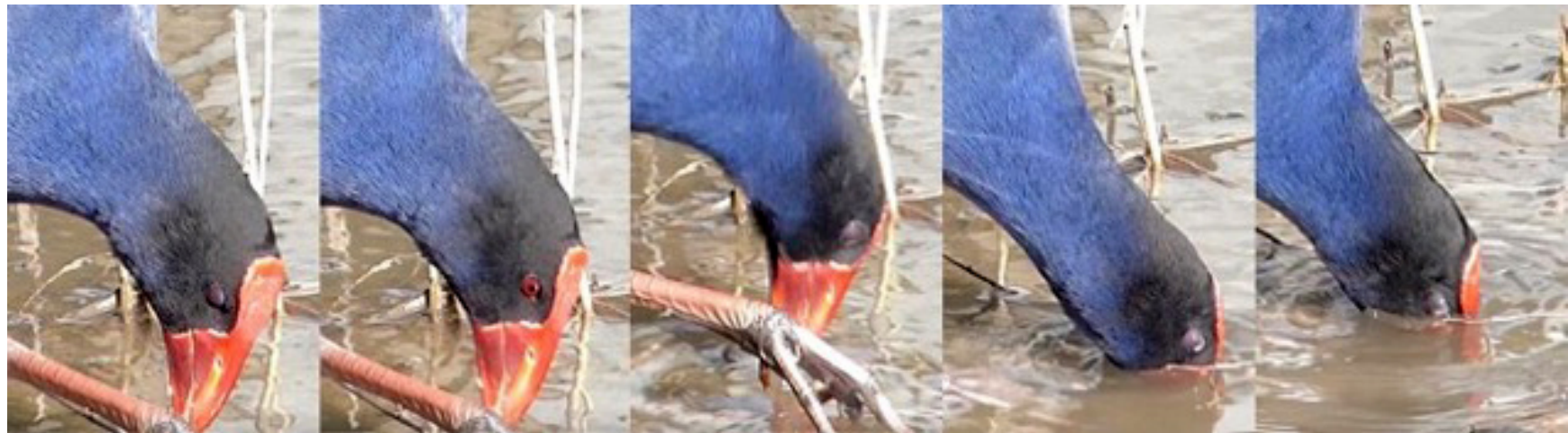


Nictitating membrane blink on head turn



Australasian swamphen (*Porphyrio melanotus*)

Nictitating membrane blink on pecking



Nictitating membrane blink on head movement

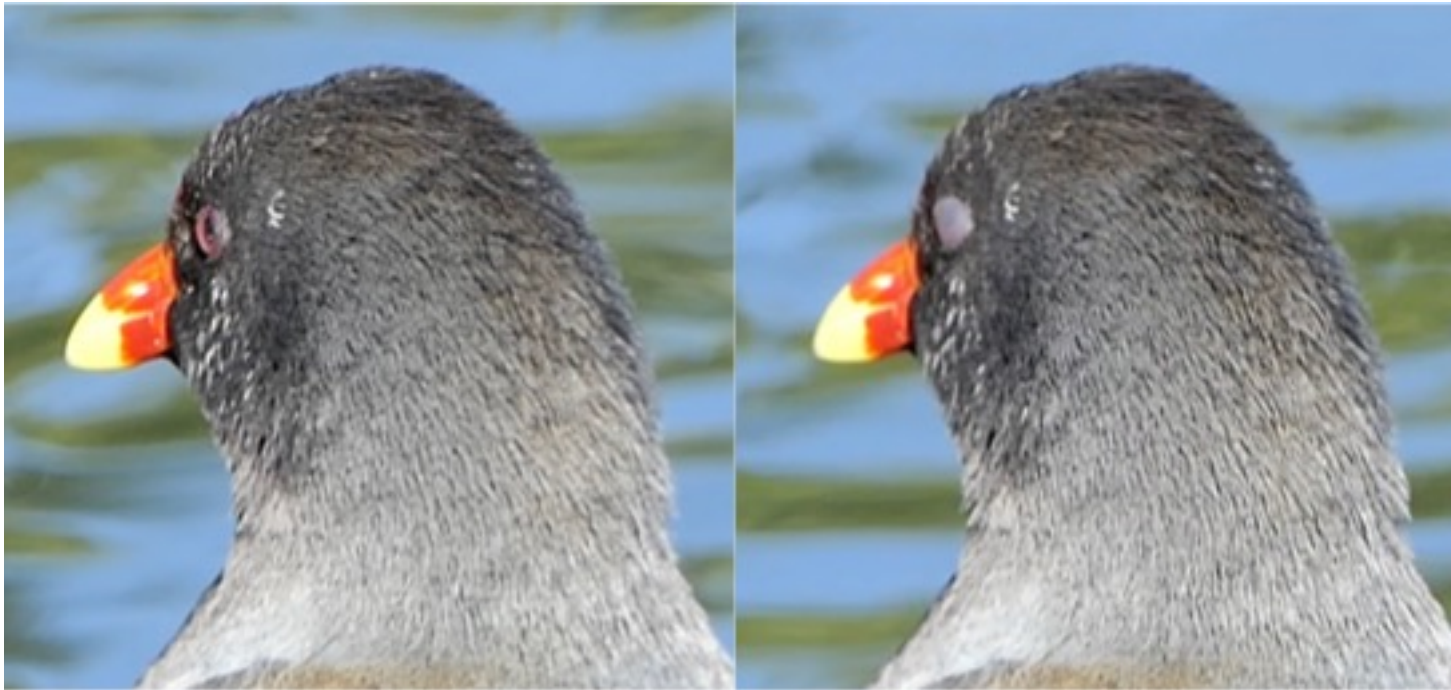


Lower lid elevated on preening



Dusky moorhen (*Gallinula tenebrosa*)

Nictitating membrane blink on head turn



Note vasculature on nictitating membrane



Non-breeding or female? Upper and lower lid blink. Not sustained through pecking



Nictitating membrane blink sustained through pecking



Nictitating membrane blink with preening

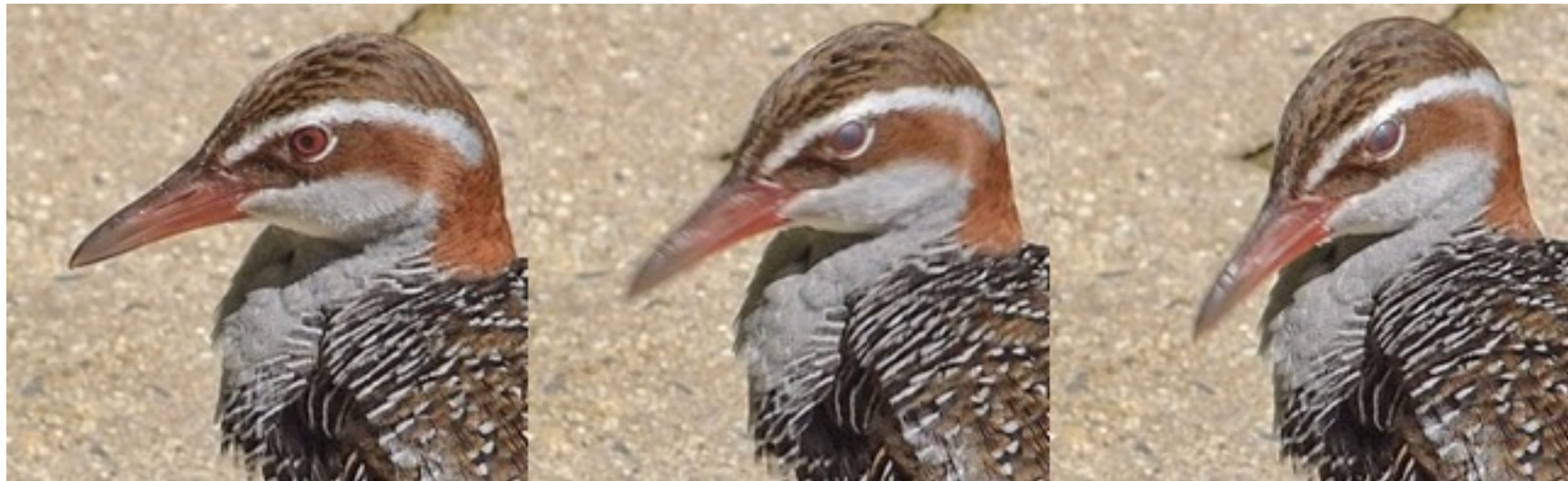


Nictitating membrane and lower lid (white) blinks



Buff-banded rail (*Hypotaenidia philippensis*)

Nictitating membrane blink on head turn



Lower lid (white lid) elevated on preening



Nictitating membrane blink on head turn



Nictitating membrane with lower lid (white lid) blink on head turn





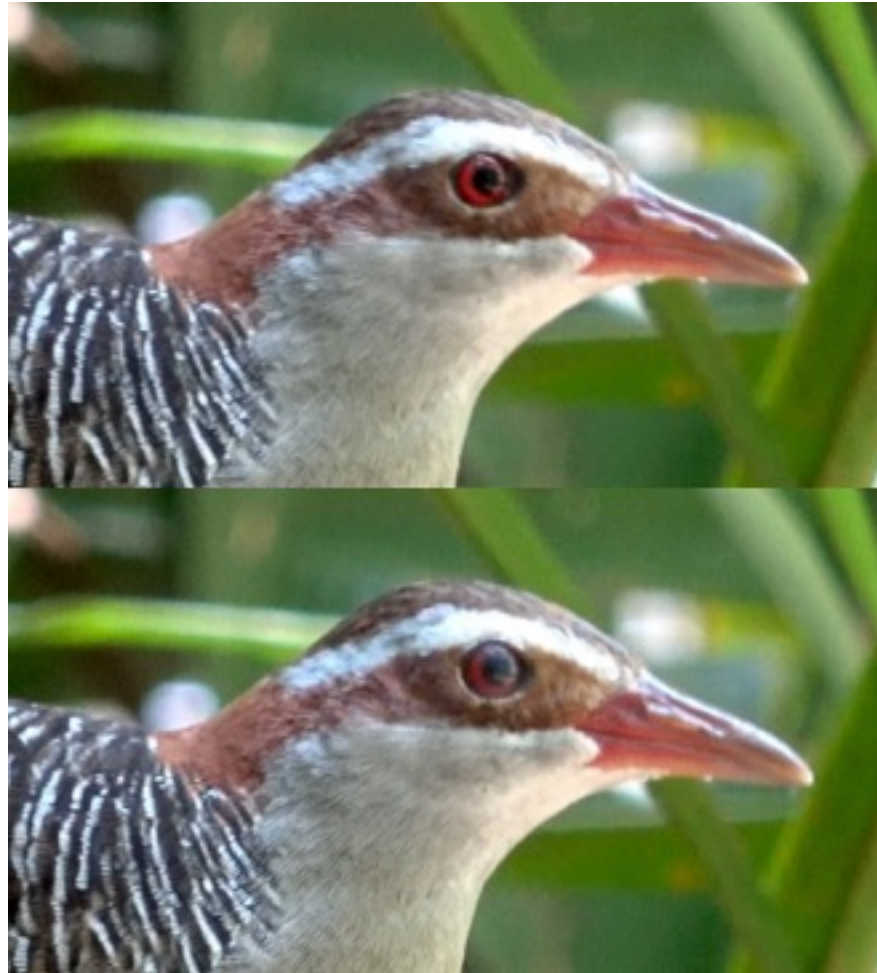
Head holds position while dunking body



Nictitating membrane blink on head turn



Nictitating membrane blink on head turn



Chestnut rail (*Eulabeornis castaneiventris*)

Nictitating membrane blink on head turn



Nictitating membrane blink on pecking

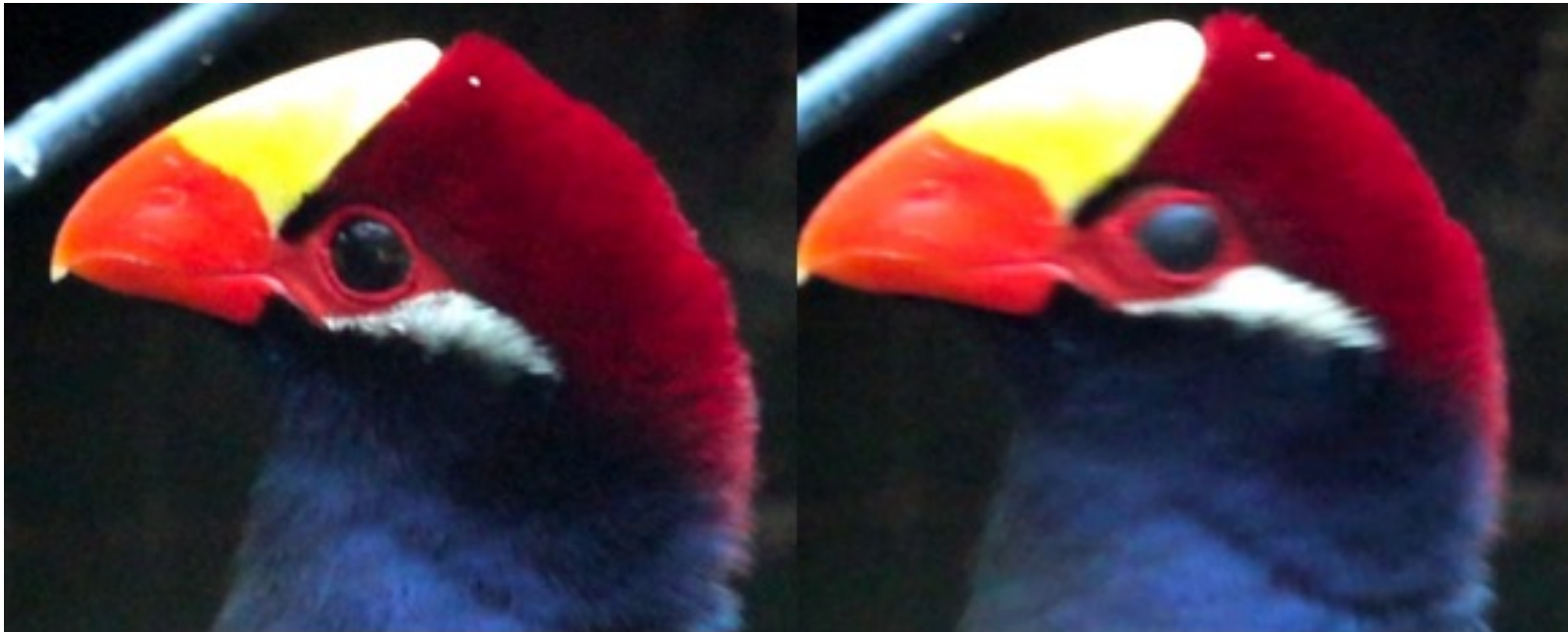


Order Musophagiformes

Family Musophagidae

Violet turaco (*Tauraco violaceus*)

Nictitating membrane blink on head turn



Nictitating membrane blink on head turn



Tilts head to look up, nictitating membrane blink (with slight lowering of inner part of upper lid) as it straightens head.

Tilts head to look down



White-cheeked turaco (*Menelikornis leucotis*)

Nictitating membrane blink on head turn





Red-crested turaco (*Tauraco erythrolophus*)

Nictitating membrane blink with head turn



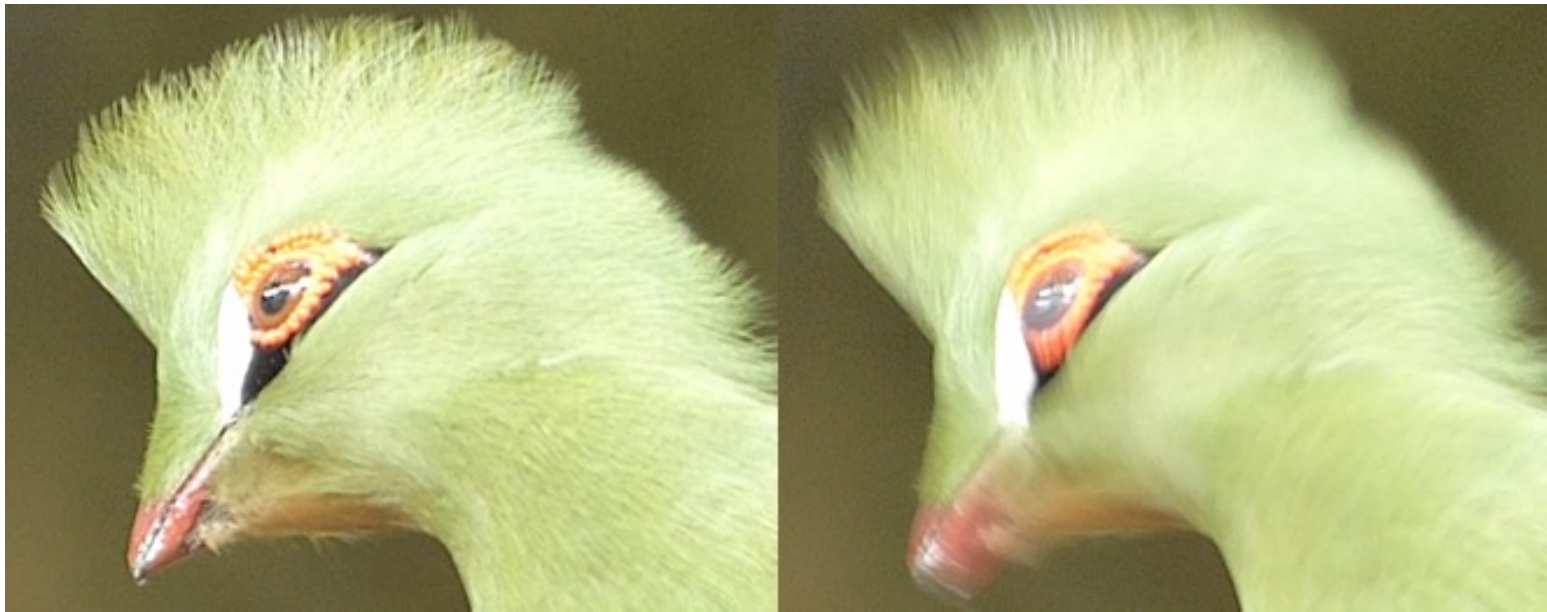
Lower lid elevation with drowsiness



Guinea turaco (*Tauraco persa*)

Nictitating membrane blink





Lady Ross's turaco (*Tauraco rossae*)

Nictitating membrane blink with slight lowering of inner part of upper lid



Western plantain-eater (*Crinifer piscator*)

Nictitating membrane blink



Order Otidiformes

Family Otididae

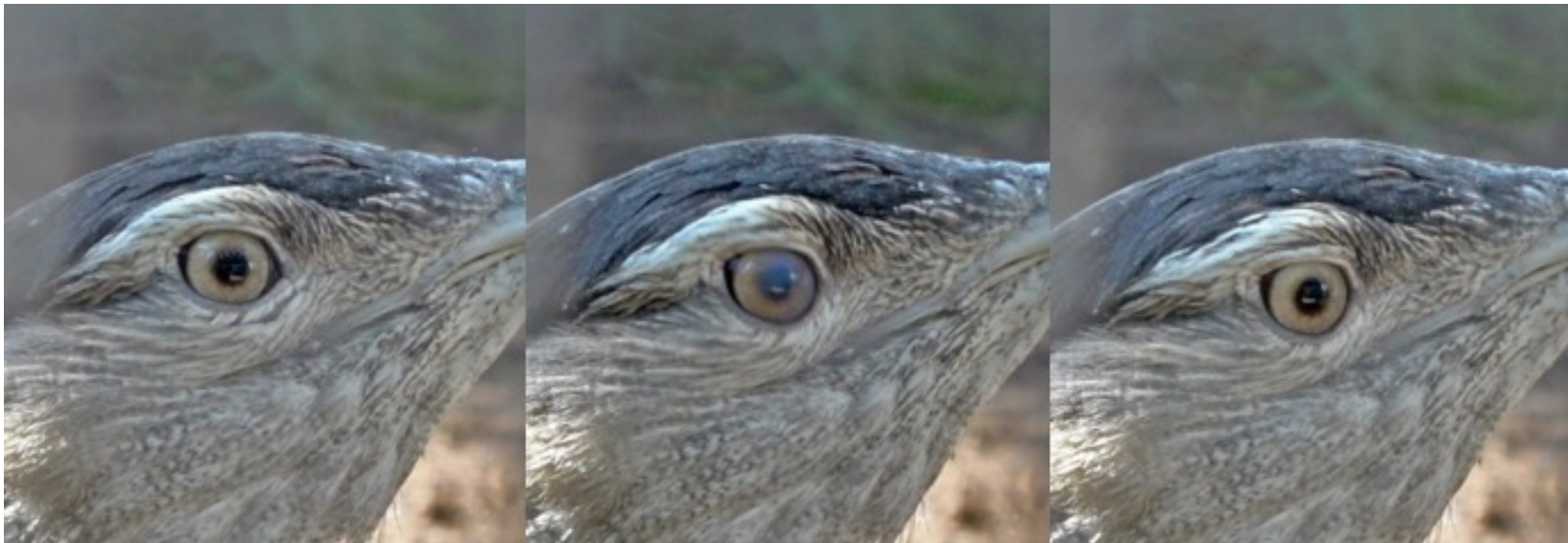
Australian bustard (*Ardeotis australis*)

Nictitating membrane blink





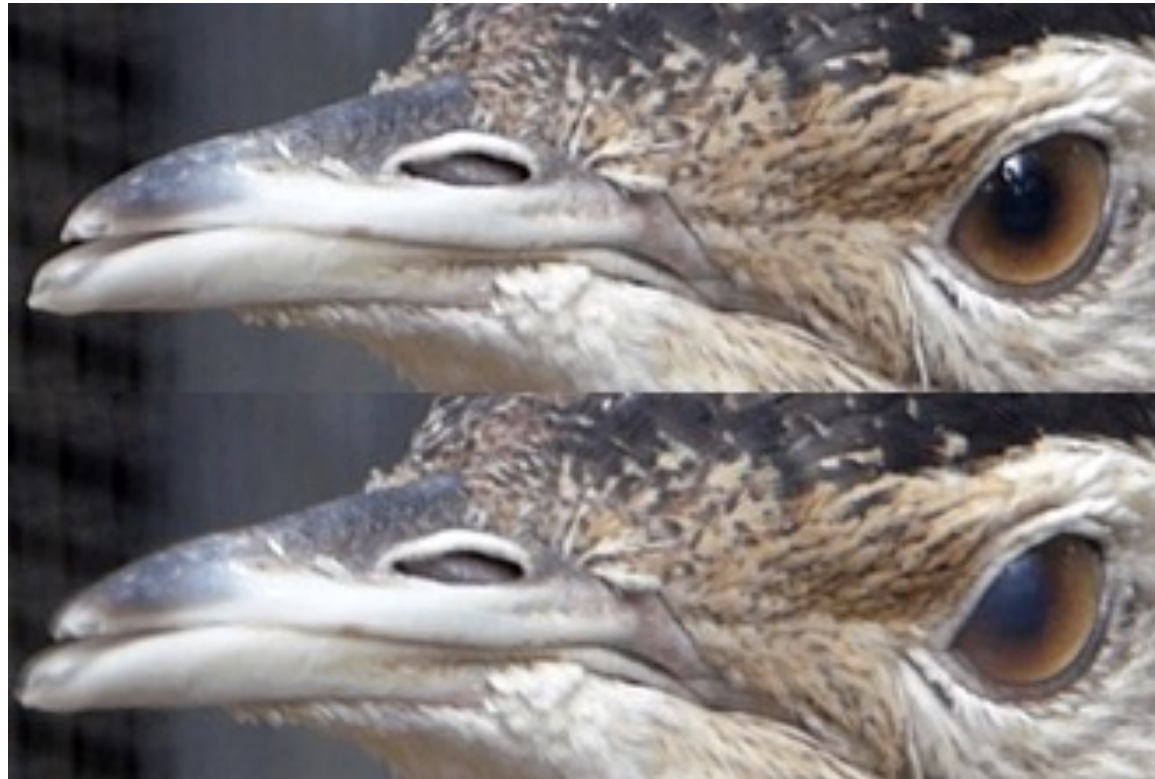
Nictitating membrane blink on eye movement



Upper lid projects on downward gaze



Nictitating membrane blink with slight fall of inner part of upper lid



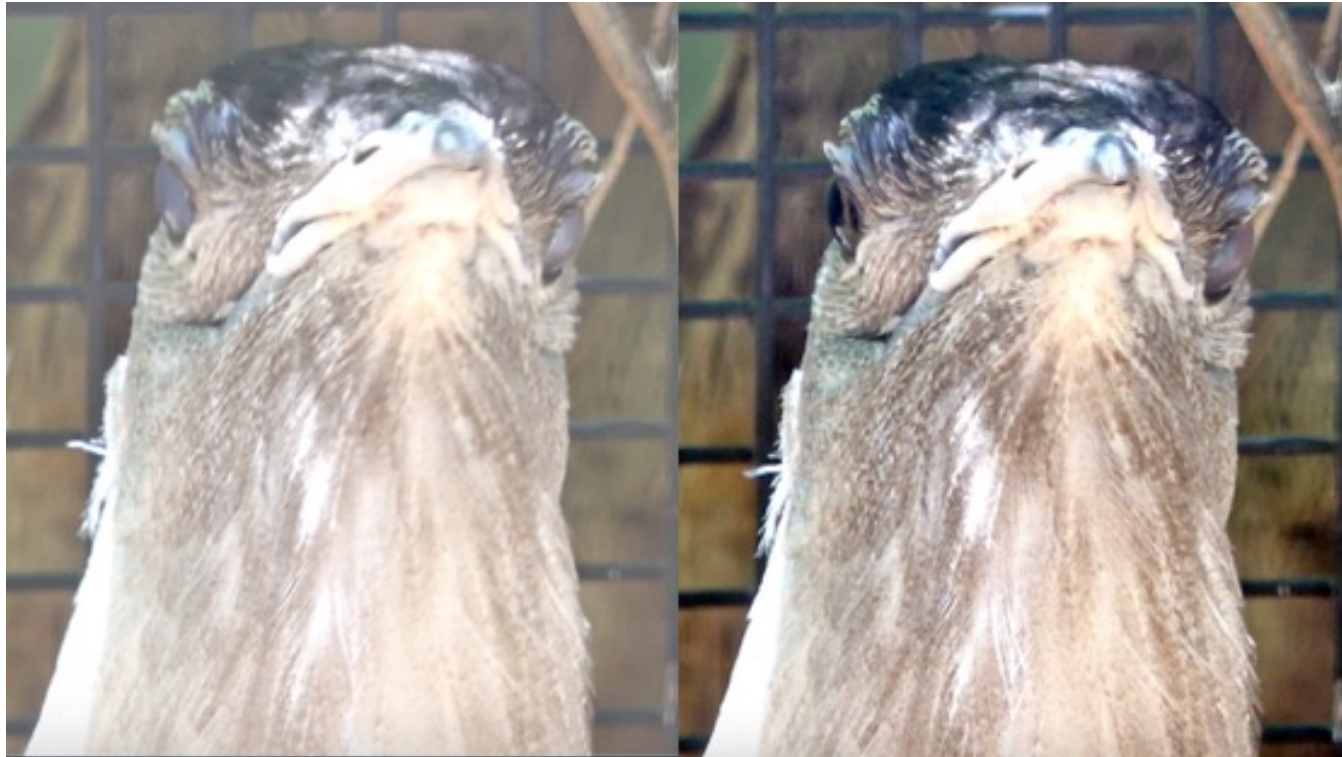
Nictitating membrane blink



Nictitating membrane blink with slight fall in inner part of upper lid



Nictitating membrane blink



Order Passeriformes

Family Fringillidae

Violaceous euphonia (*Euphonia violacea*)

No blink on pecking



Family Alaudidae

Eurasian skylark (*Alauda arvensis*)

Upper lid blink





Family Acanthizidae

White-browed scrubwren (*Sericornis frontalis*)



Brown thornbill (*Acanthiza pusilla*)

Nictitating membrane blink





Family Acrocephalidae

Australian reed warbler (*Acrocephalus australis*)



Family Artamidae

Australian magpie (*Gymnorhina tibicen*)

Nictitating membrane blink on head turn



Juvenile. Nictitating membrane blink on head turn



Sustained nictitating membrane blink on pecking



No nictitating membrane blink on pecking small object



Whole upper lid drops during nictitating membrane blink



Nictitating membrane blink







Pied butcherbird (*Cracticus nigrogularis*)

Adult. Nictitating membrane blink on head turn



Juvenile. Nictitating membrane blink on head turn



Grey butcherbird (*Cracticus torquatus*)

Nictitating membrane blink on head turn



Black butcherbird (*Melloria quoyi*)

Nictitating membrane blink on head turn





Pied currawong (*Strepera graculina*)

Nictitating membrane blink on head turn



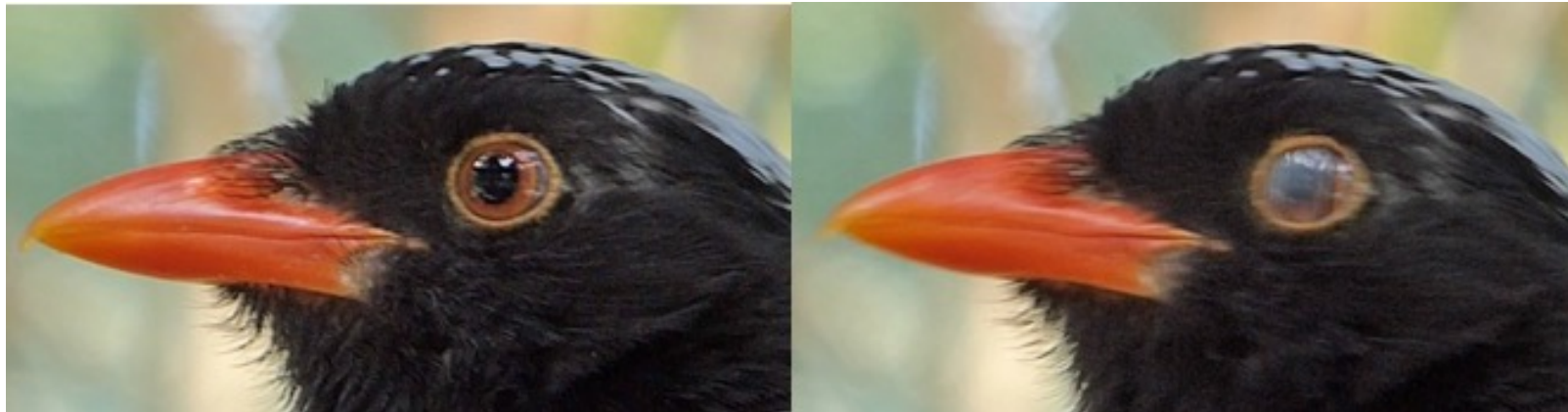
Red-billed blue magpie (*Urocissa erythroryncha*)

Nictitating membrane blink on head turn





Nictitating membrane blink



Family Artamidae

White-breasted woodswallow (*Artamus leucorhynchus*)

Nictitating membrane blink on head turn



Lower lid elevated during preening



Nictitating membrane blink followed by lower lid elevation with preening





White-browed woodswallow (*Artamus superciliosus*)



Nictitating membrane blink



Nictitating membrane and lower lid blink with preening



Dusky woodswallow (*Artamus cyanopterus*)



Family Cisticolidae

Golden-headed cisticola (*Cisticola exilis*)



Family Ploceidae

Village weaver (*Ploceus cucullatus*)



Red fody (*Foudia madagascariensis*)



Northern red bishop (*Euplectes franciscanus*)

Nictitating membrane blink on head turn



Nictitating membrane blink on head turn



Family Pittidae

Noisy pitta (*Pitta versicolor*)

Nictitating membrane blink





Family Hirundinidae

Welcome swallow (*Hirundo neoxena*)



Lower lid elevation on preening



Moulting. Lower lid elevation with drowsiness



Family Menuridae

Superb lyrebird (*Menura novaehollandiae*)

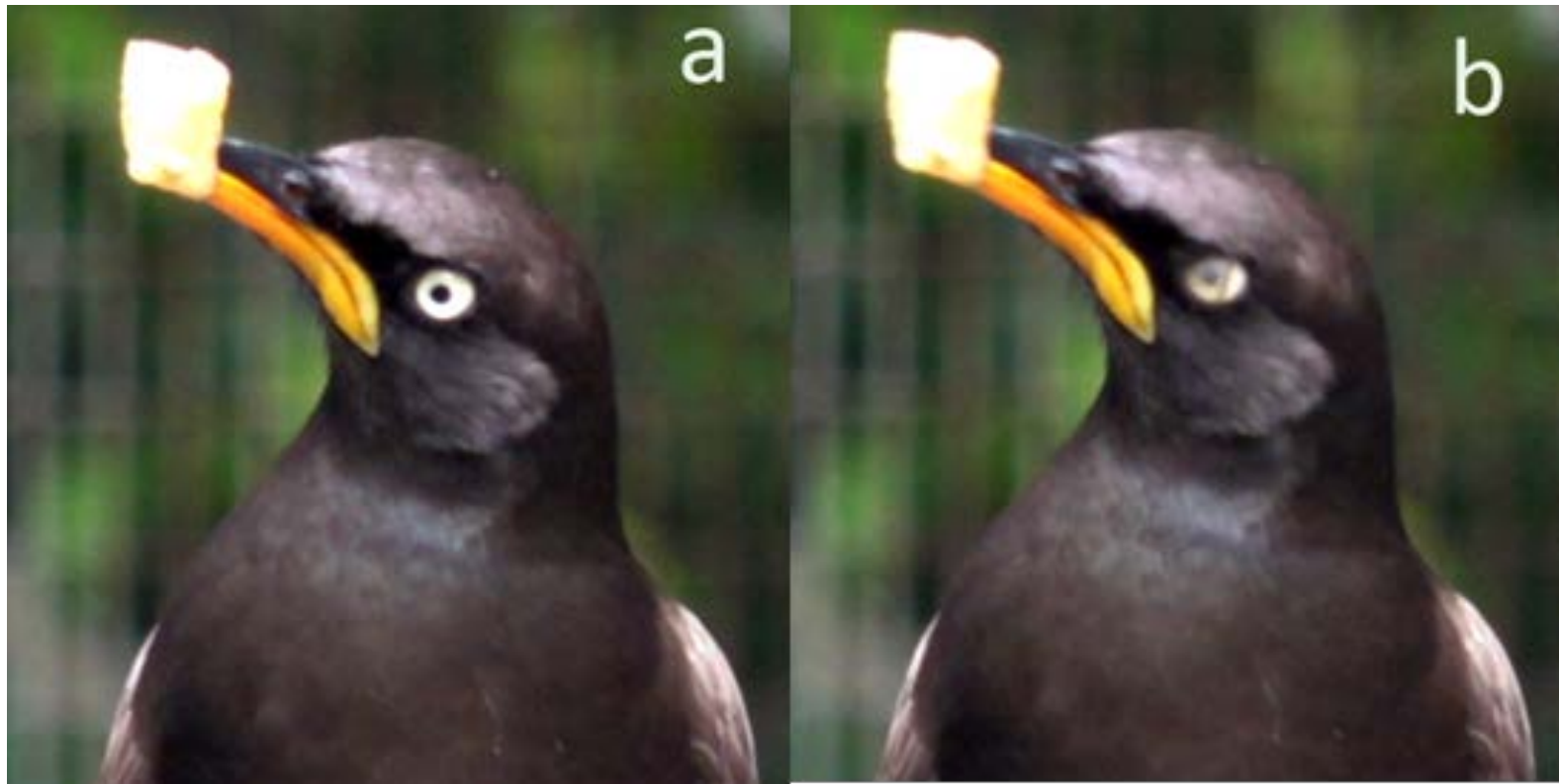
Nictitating membrane blink



Family Sturnidae

African pied starling, (*Lamprotornis bicolor*)

Nictitating membrane blink



Emerald starling (*Lamprotornis iris*)

Nictitating membrane blink with slight lowering of inner part of upper lid



Nictitating membrane blink with elevation of lower lid during preening



Red-winged starling (*Onychognathus morio*)

Nictitating membrane blink on head turn



Common starling (*Sturnus vulgaris*)

Nictitating membrane blink on head turn



Golden-breasted starling (*Lamprotornis regius*)

Nictitating membrane blink with slight lowering of upper lid



Metallic starling (*Aplonis metallica*)



Hard to see any nictitating membrane blink.



Juvenile

Superb starling (*Lamprotornis superbus*)

Nictitating membrane blink



Violet-backed starling (*Cinnyricinclus leucogaster*)

Nictitating membrane blink



Repeated pupillary constriction during feeding



Female. Nictitating membrane blink



Nictitating membrane and lower lid blink with drowsiness



Upper lid movement – not really a blink





Common hill myna (*Gracula religiosa*)

Nictitating membrane blink on head turn



Changes in pupil size



Bali myna (*Leucopsar rothschildi*)

Nictitating membrane blink with slight lowering of inner part of upper lid on head turn



Lower lid elevation during preening



Nictitating membrane blink with less obvious lowering of inner part of upper lid on head turn



Jungle myna (*Acridotheres fuscus*)

Nictitating membrane blink

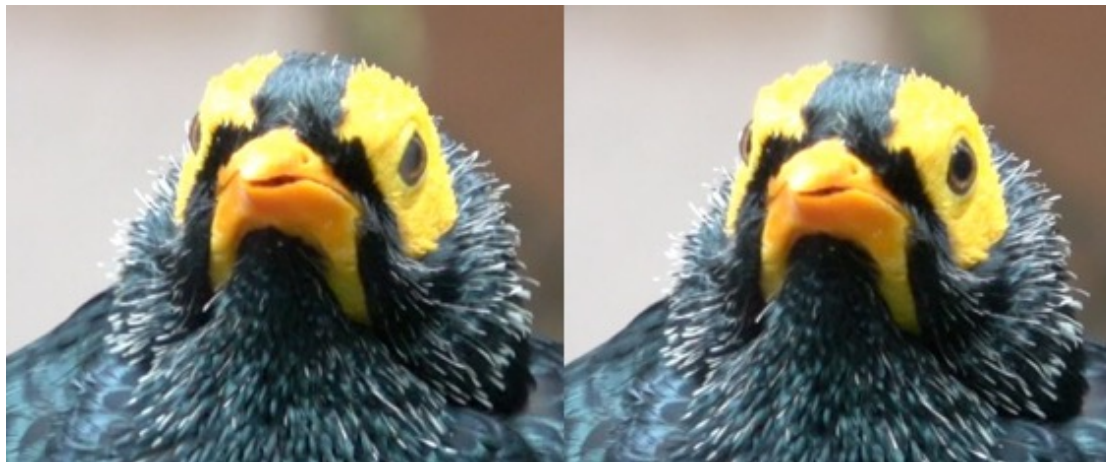


Yellow-faced myna (*Mino dumontii*)

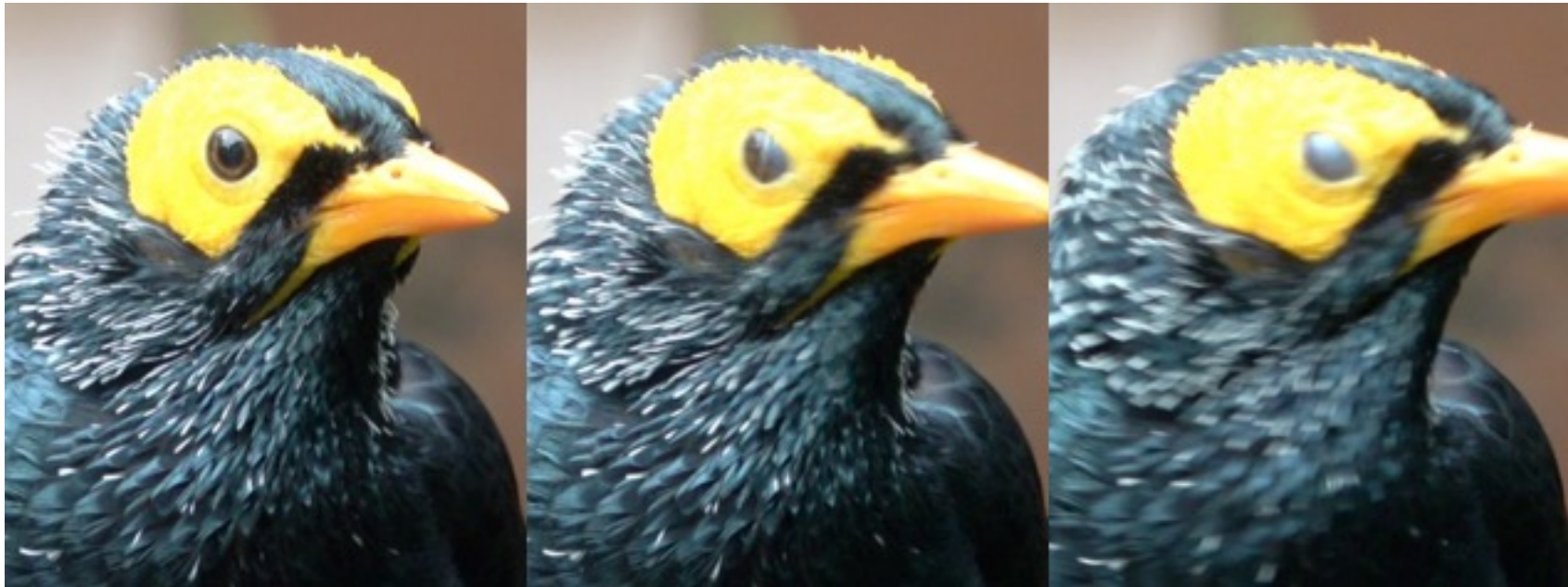
Nictitating membrane blink on head turn



Nictitating membrane blink with slight lowering of upper lid



Nictitating membrane blink with slight lowering of upper lid



Indian myna (*Acridotheres tristis*)

Nictitating membrane blink with slight lowering of inner part of upper lid



Nictitating membrane blink with slight lowering of inner part of upper lid



Family Momotidae

Blue-crowned motmot (*Momotus coeruliceps*)

Upper lid (coloured white) and nictitating membrane blink on head movement



Family Monarchidae

Magpie-lark (*Grallina cyanoleuca*)

Nictitating membrane blink on head turn





Family Motacillidae

Australasian pipit (*Anthus novaeseelandiae*)

Upper lid blink on head movement



Family Campephagidae

White-bellied cuckooshrike (*Coracina papuensis*)

Nictitating membrane blink



Black-faced cuckooshrike (*Coracina novaehollandiae*)

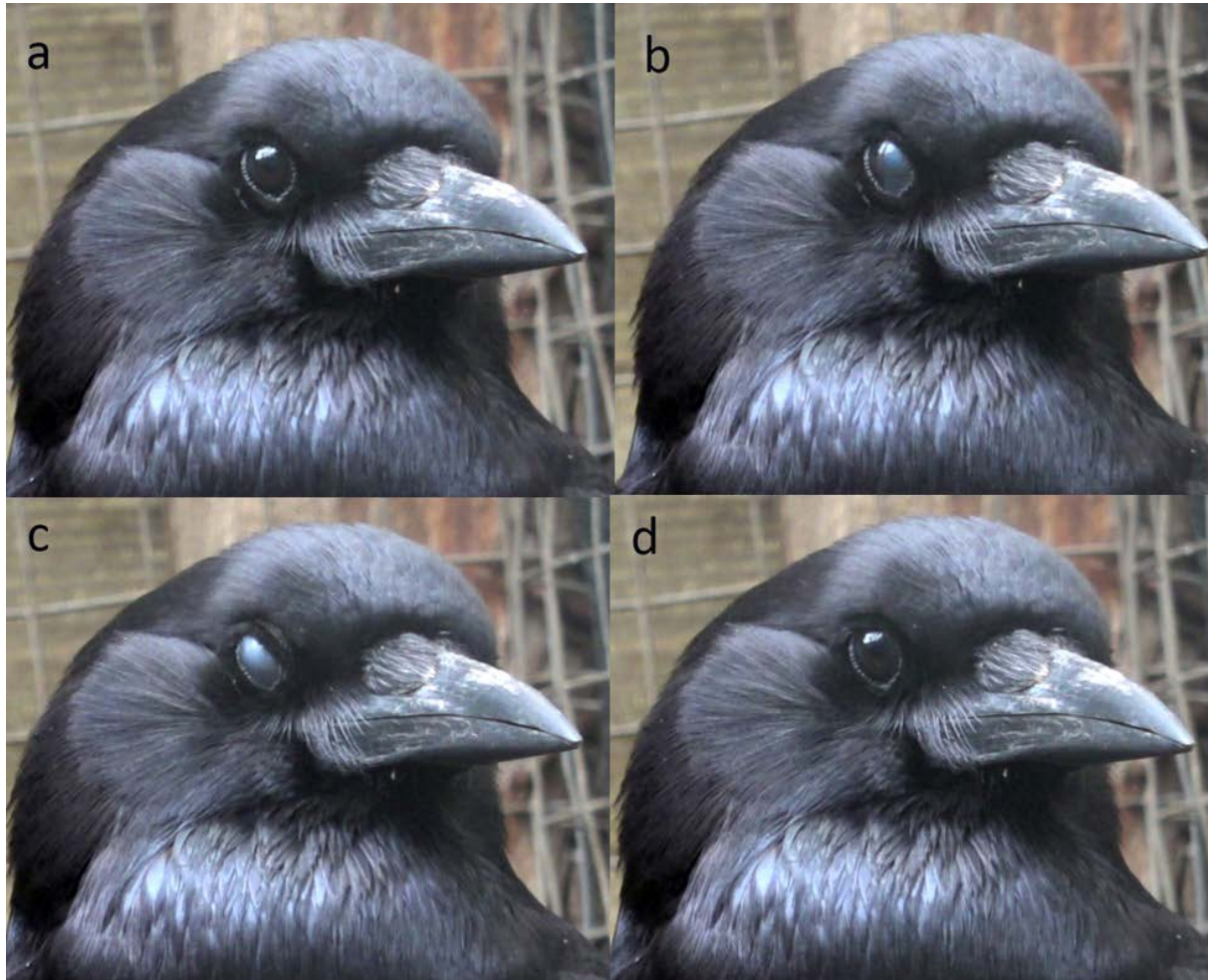
Nictitating membrane blink





Family Corvidae

Black crow (*Corvus capensis*)



a) Pre-blink. Note that the canthi lie almost at right angles to the bill. b) An opaque nictitating membrane moves out from under the upper lid. c) Maximal blink. Nictitating membrane covers the eye. The upper lid has moved across the eye a little. d) Post-blink

Indian house crow (*Corvus splendens*)



a) Pre-blink. b) Opaque nictitating membrane appears on head movement.

Pied crow (*Corvus albus*)

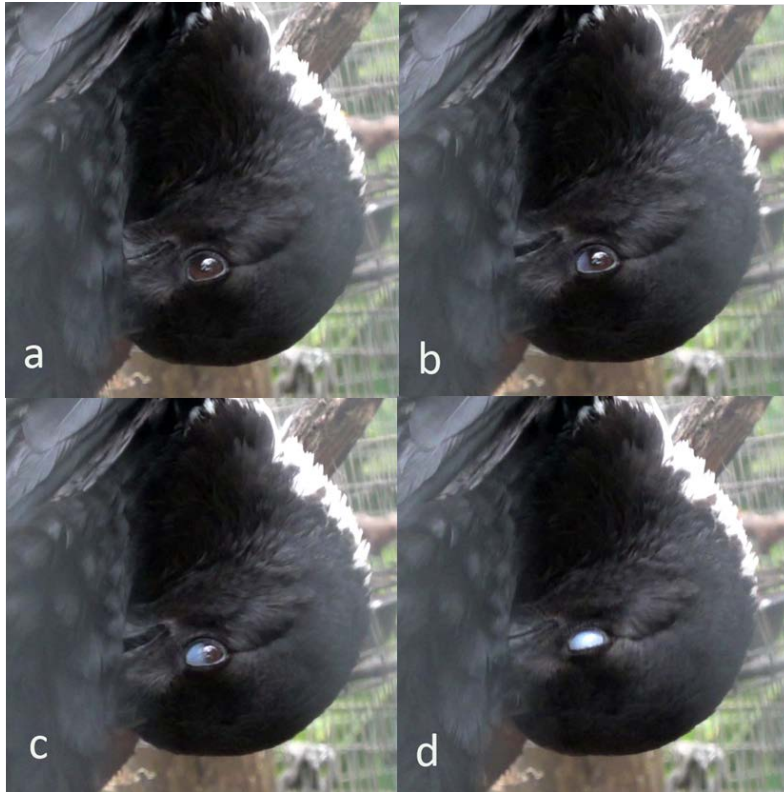
White-necked raven (*Corvus albicollis*)



a) Pre-blink. b) Nictitating membrane covers eye on head movement.



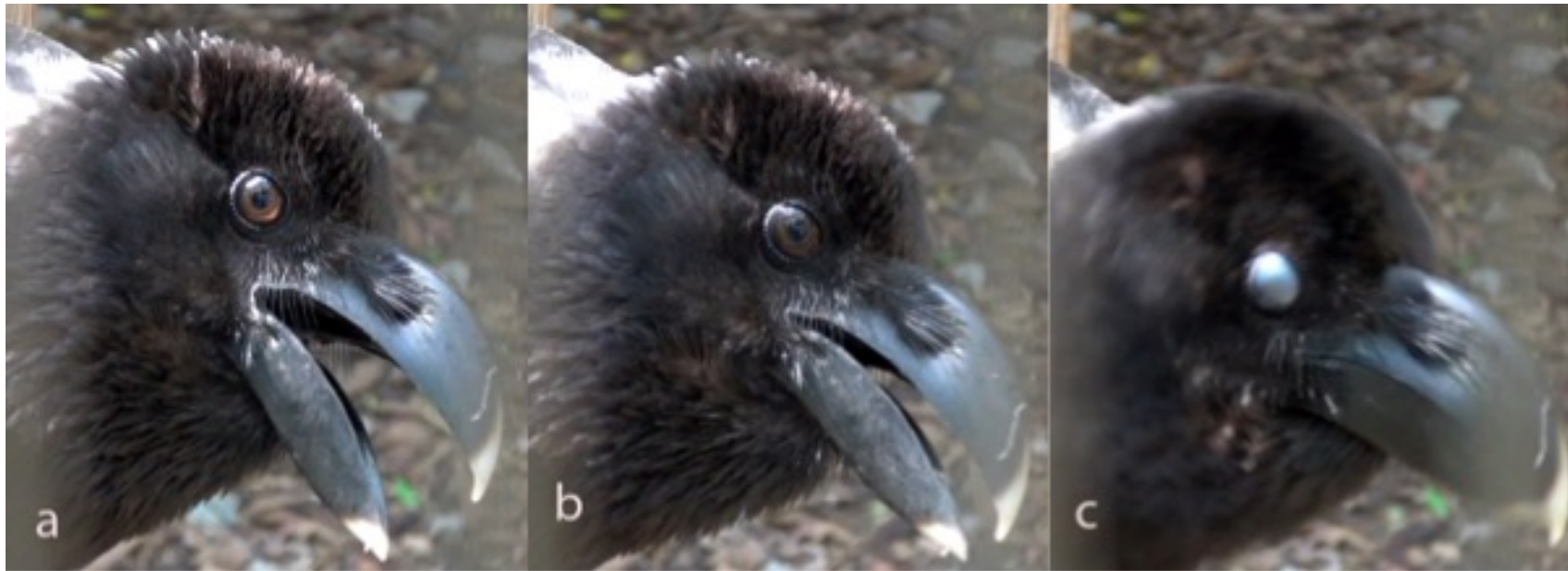
Large long beak – perhaps not necessary to raise lower lid to protect the eyes during preening



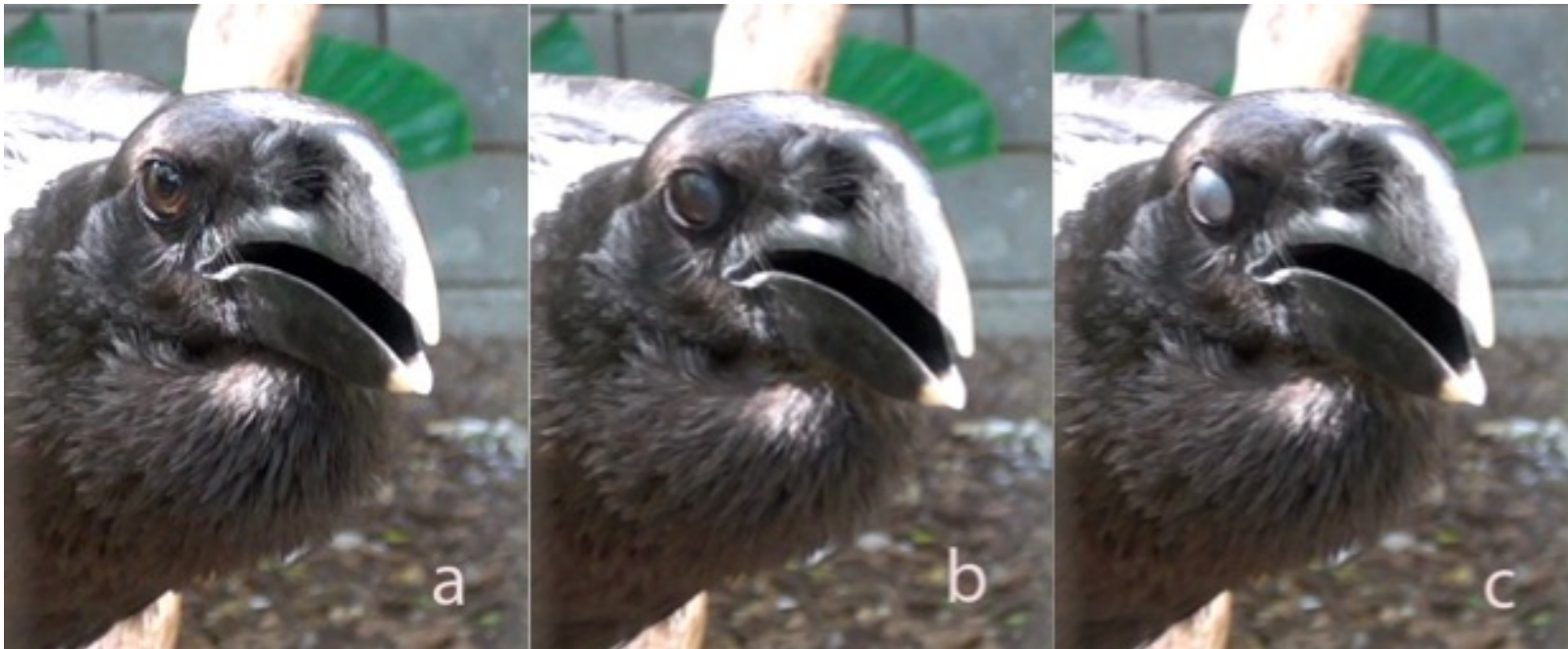
a) Pre-blink. Preening. b) Nictitating membrane starts to emerge from inner canthus. Note that lower lid has not elevated. c) Nictitating membrane is halfway across the eye. d) Full nictitating membrane blink. Narrowed palpebral fissure. This was a brief blink during a prolonged period of preening.



No elevation of the lower lid during preening.



An unusual blink. a) Pre-blink. b) A semi-transparent nictitating membrane appears to have covered the cornea. c) With further movement, the nictitating membrane has become opaque.



a) Pre-blink. b) A semi-transparent nictitating membrane covers the cornea. c) With further movement, the nictitating membrane now becomes opaque.

Ratchet-tailed treepie (*Temnurus temnurus*)

Nictitating membrane blink on head movement



Azure-winged magpie (*Cyanopica cyanus*)

Nictitating membrane blink on head movement



Common raven (*Corvus corax*)



Australian raven (*Corvus coronoides*)

Nictitating membrane blink on head movement











Carrion crow (*Corvus corone*)

Nictitating membrane blink on head movement



Nictitating membrane blink on pecking







Common magpie (*Pica pica*)

Nictitating membrane blink on head movement



Western jackdaw (*Coloeus monedula*)
Nictitating membrane blink on head movement



Nictitating membrane blink on bill wiping



Rook (*Corvus frugilegus*)



Family Leiothrichidae

Sumatran laughingthrush (*Garrulax bicolor*)

Nictitating membrane blink



Red-billed leiothrix (*Leiothrix lutea*)

Upper lid and nictitating membrane blink on head turn



Lower lid elevation on preening



Upper lid lowered on preening



Lower lid elevated on preening



Blue-crowned laughingthrush (*Pterorhinus courtoisi*)

Nictitating membrane blink on head turn



Family Turdidae

Song thrush (*Turdus philomelos*)



Very hard to see nictitating membrane blinks in small birds like this because they are usually associated with rapid head movements.

Common blackbird (*Turdus merula*)
Moulting. Slight upper lid blink on head turn



Juvenile. Nictitating membrane blink with slight lowering of inner part of upper lid



Orange-headed thrush (*Geokichla citrina*)

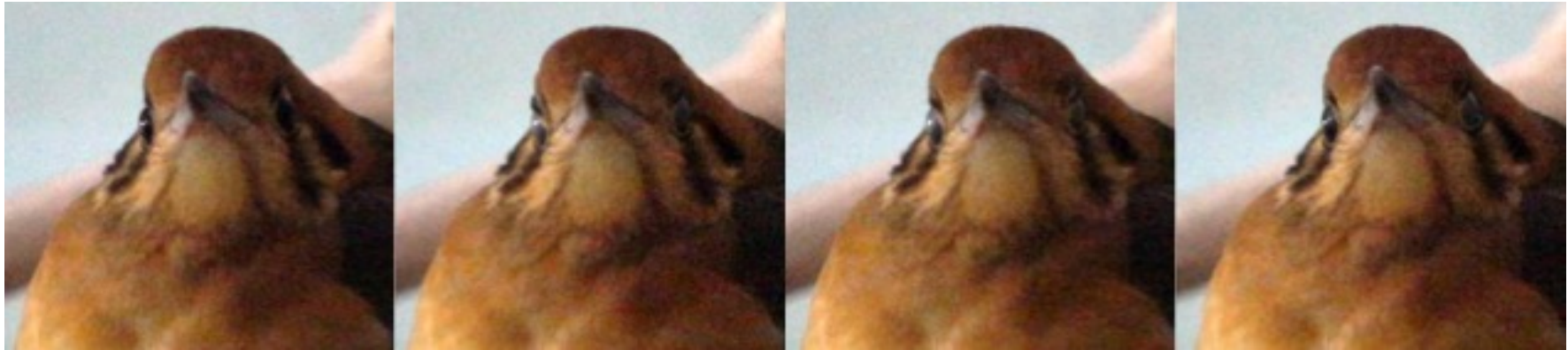
Anting





Anting. Nictitating membrane blink with slight lowering of inner part of upper lid.

Lowers it upper lid slightly on doing a nictitating membrane blink



Family Prunellidae

Dunnock (*Prunella modularis*)



Very hard to see nictitating membrane blinks in small birds like this because they are usually associated with rapid head movements.

Family Passeridae

Cape sparrow (*Passer melanurus*)



a) Pre-blink. b) Upper lid partially lowers on head movement.



House sparrow (*Passer domesticus*)



Narrowed palpebral fissure.



Upper lid blink.

Family Estrildidae

Blue-faced parrotfinch (*Erythrura trichroa*)

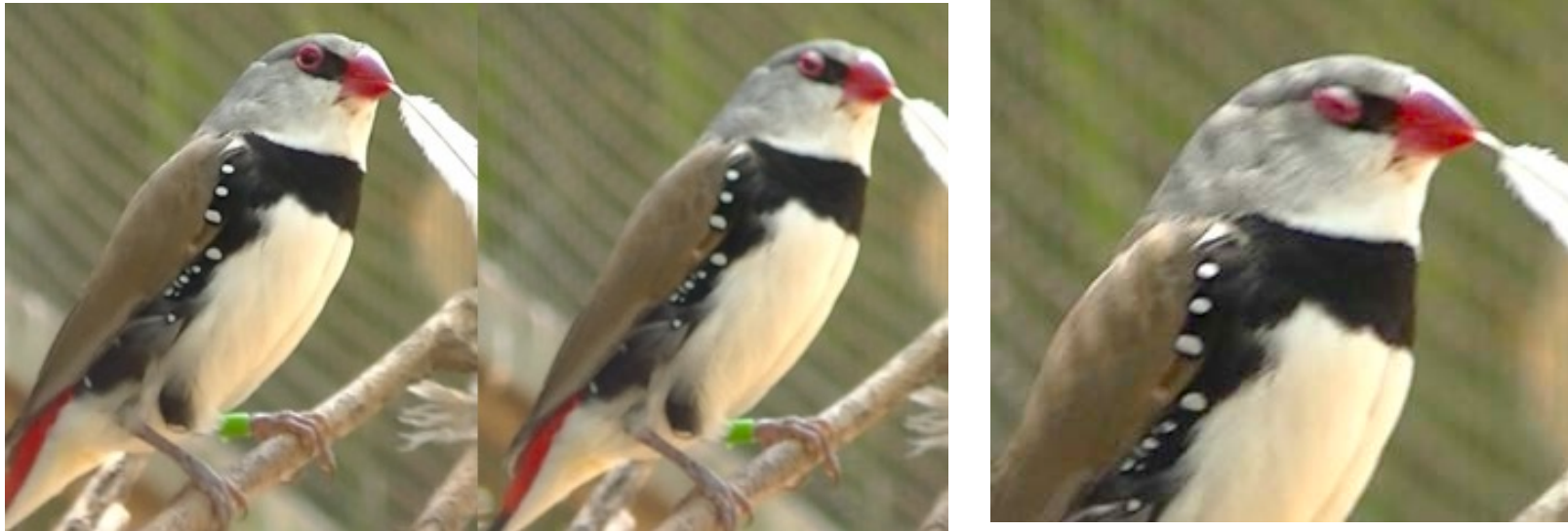


Diamond firetail (*Stagonopleura guttata*)

Upper lid blink



Upper lid blink

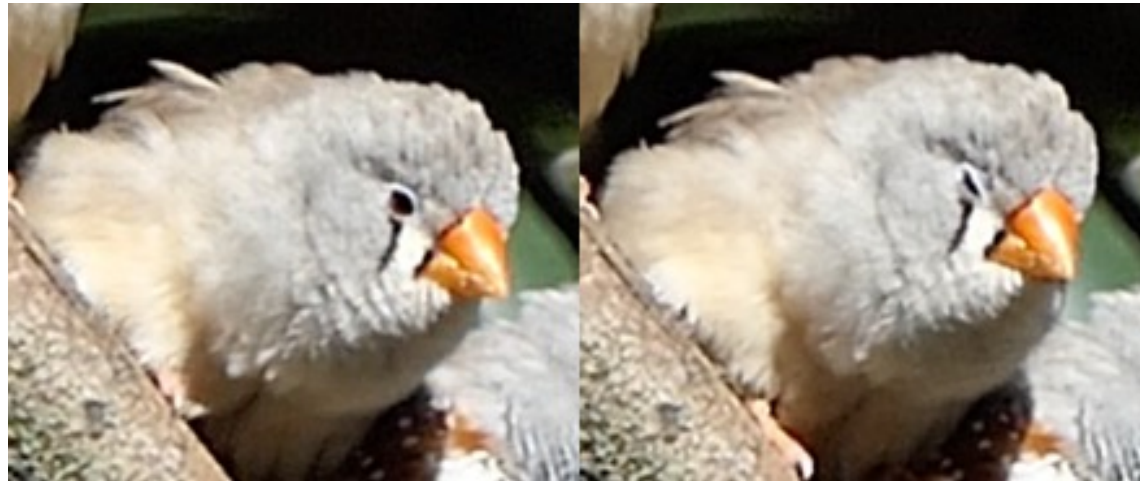


Zebra finch (*Taeniopygia guttata*)

Upper lid blink on head turn



Juvenile. Upper lid blink on head turn



Upper then lower lid blink with drowsiness

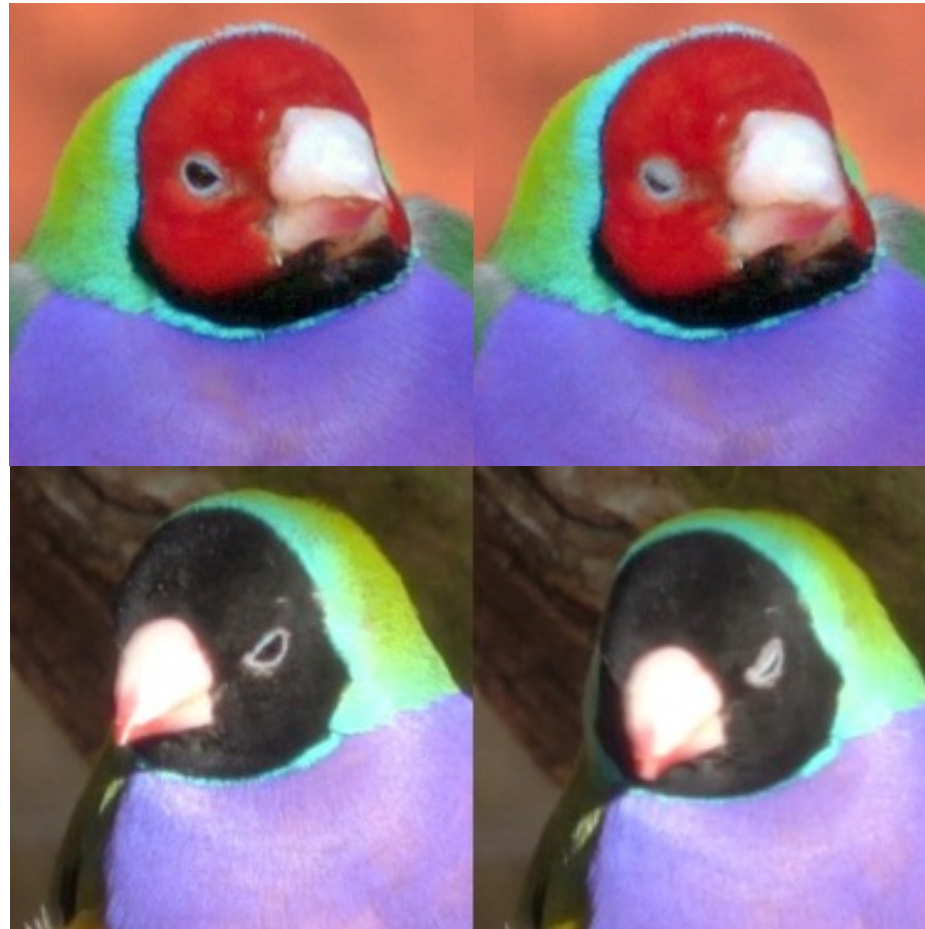


Adult. Upper and lower lid elevated during peck



Gouldian finch (*Chloebia gouldiae*)

Upper lid blink on head turn



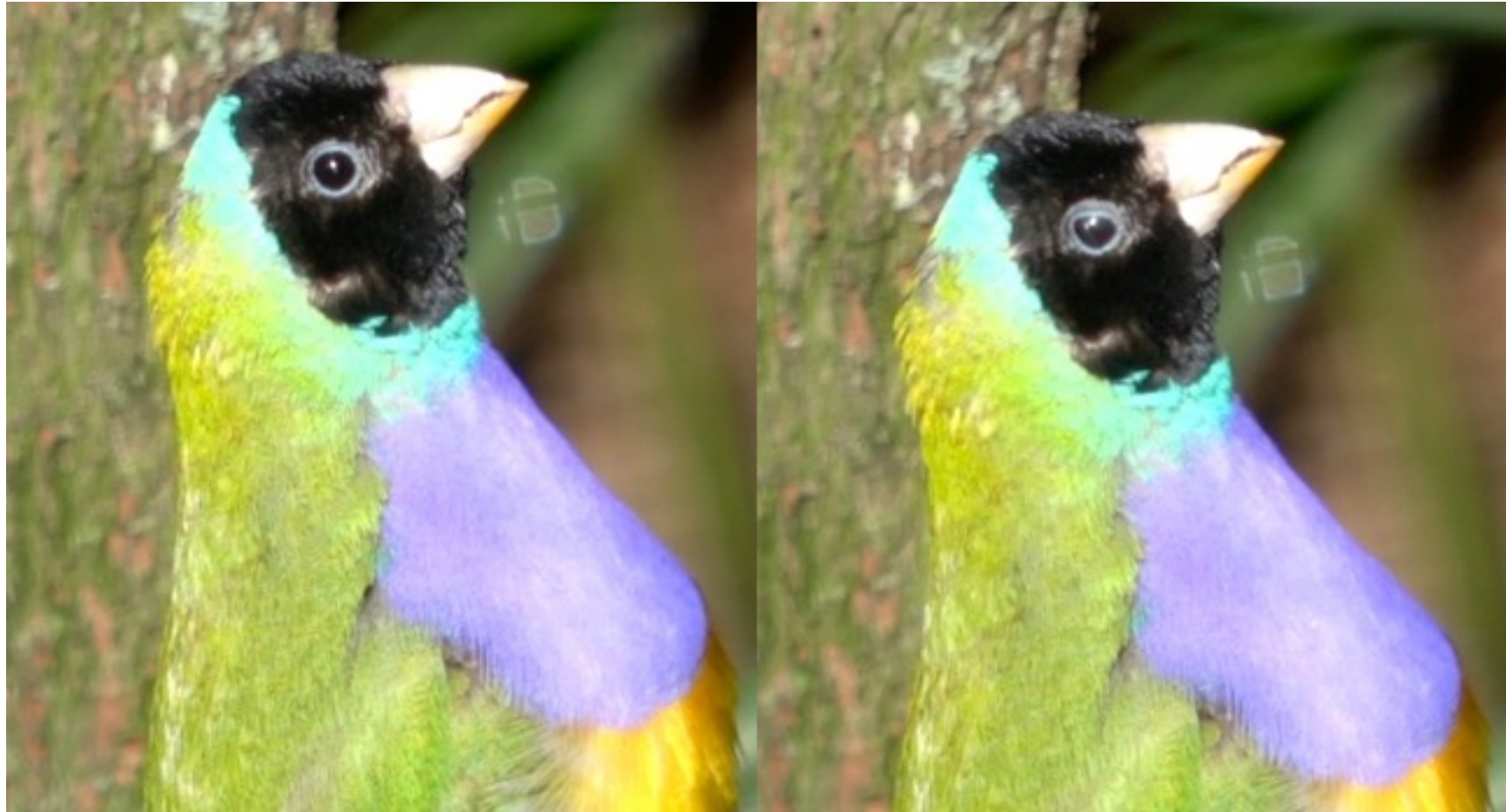
Upper lid lowered on preening



Lower lid elevation on preening



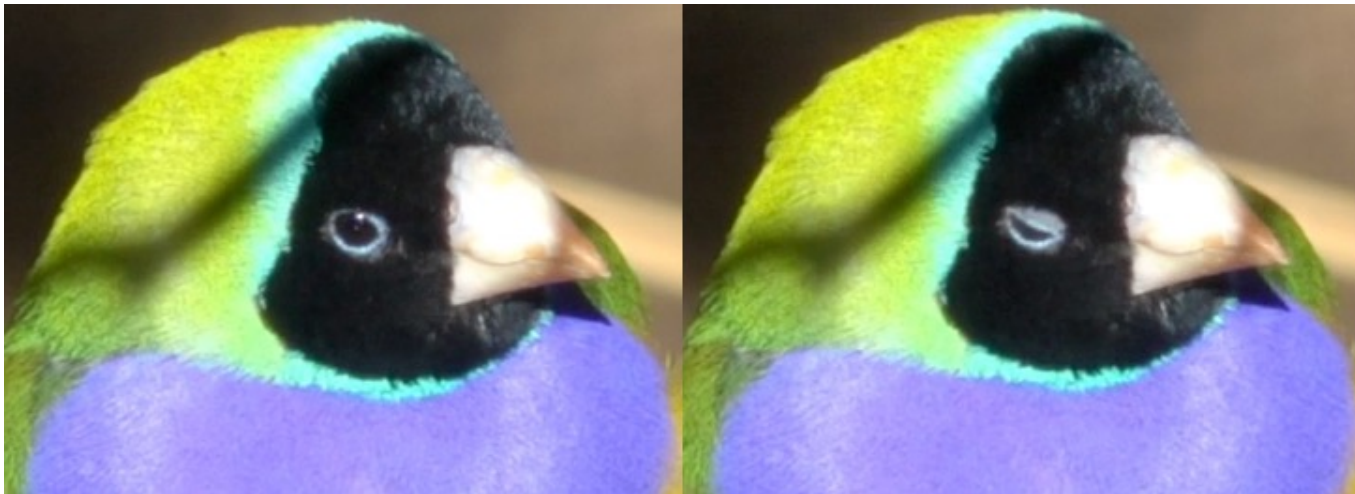
Nictitating membrane blink with slight lowering of upper lid



Nictitating membrane blink with slight lowering of upper lid



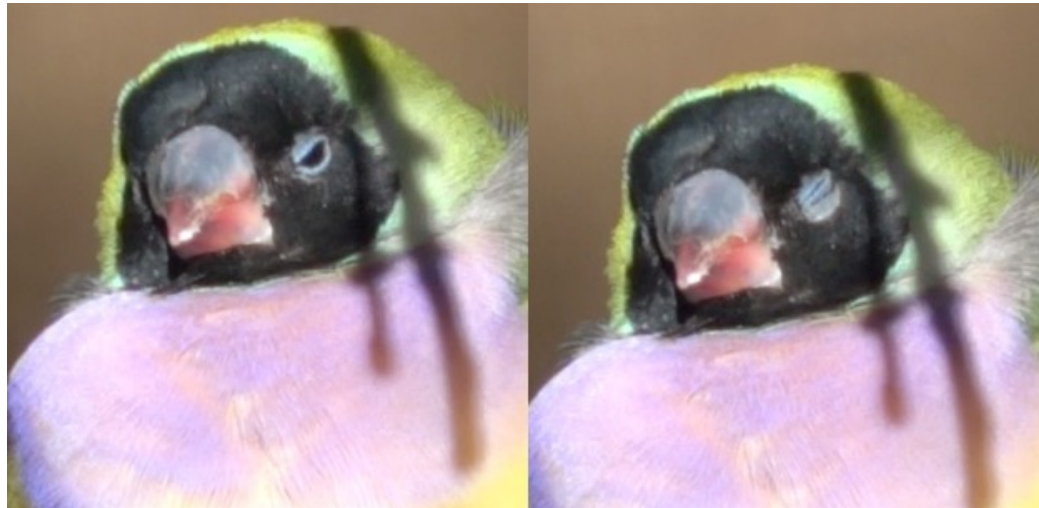
Upper lid blink



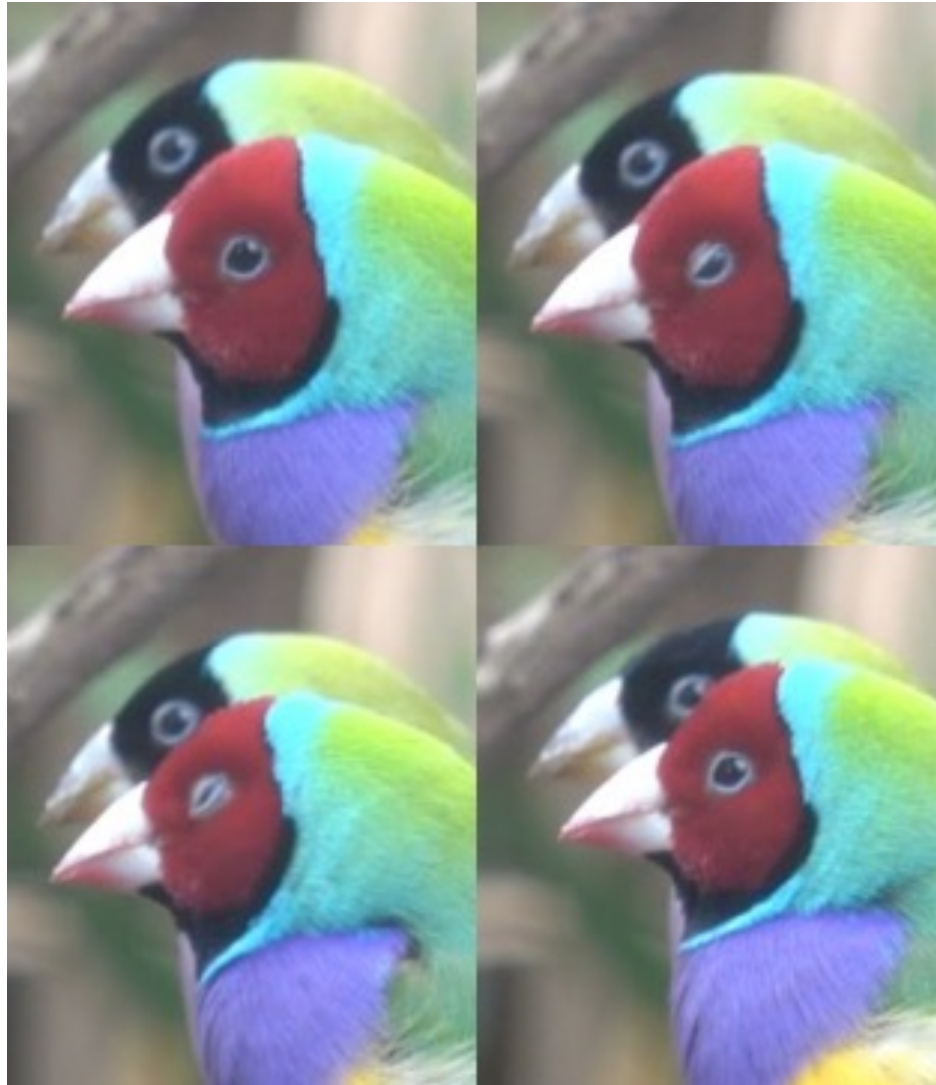
Lower lid blink



Upper and lower lid blink



Upper and lower lid blink



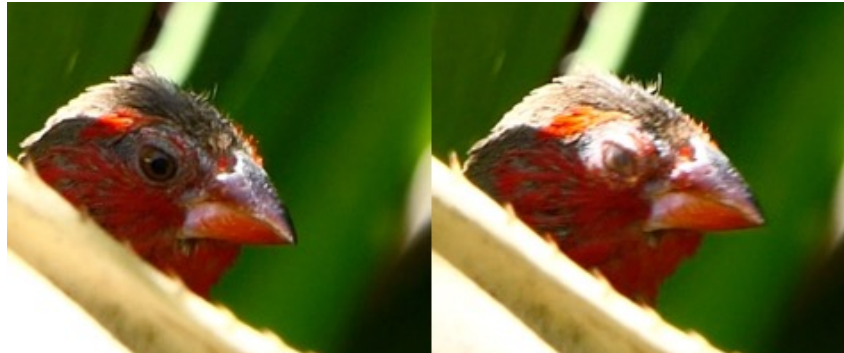
Red-browed finch (*Neochmia temporalis*)



?Upper lid blink.

Crimson finch (*Neochmia phaeton*)

Nictitating membrane blink with slight lowering of upper lid on head turn



Elevation of lower lid with drowsiness



Upper lid blink on head turn



Star finch (*Bathilda ruficauda*)



Masked finch (*Poephila personata*)

Lower lid blink on preening



Upper lid blink on head turn.

Red-cheeked Cordonbleu female (*Uraeginthus bengalus*)



Black-faced quailfinch (*Ortygospiza atricollis atricollis*)

Upper lid blink on head turn



Common waxbill (*Estrilda astrild*)

Upper lid blink on head turn



Upper and lower lid blink on head turn



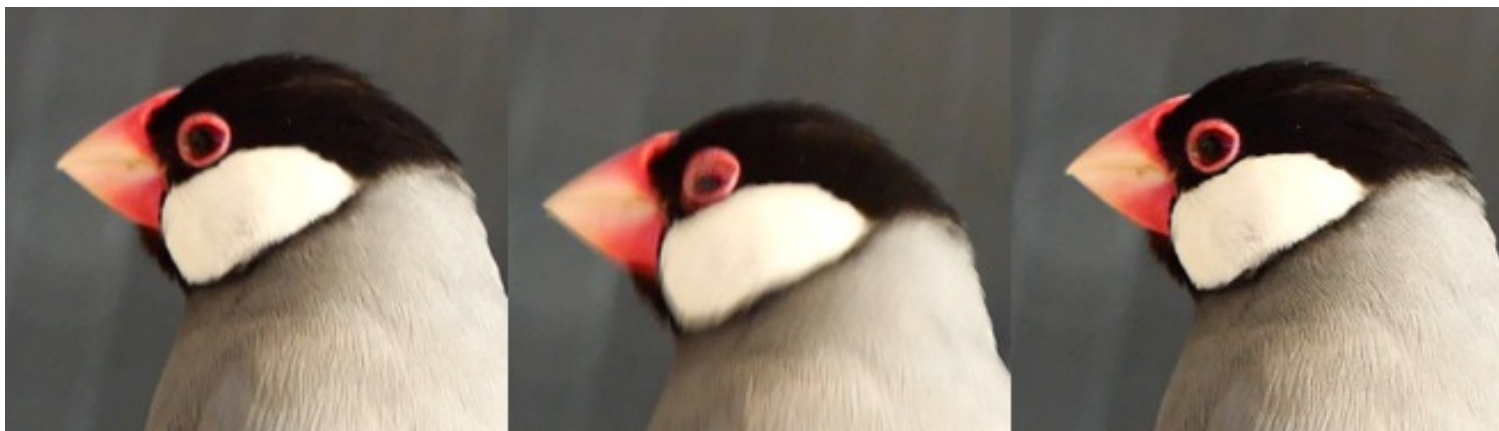
Yellow-bellied waxbill (*Coccothraustes vespertina*)



Java sparrow (*Padda oryzivora*)
Juvenile. Upper lid blink on head turn



Adult. Upper lid blink on head turn





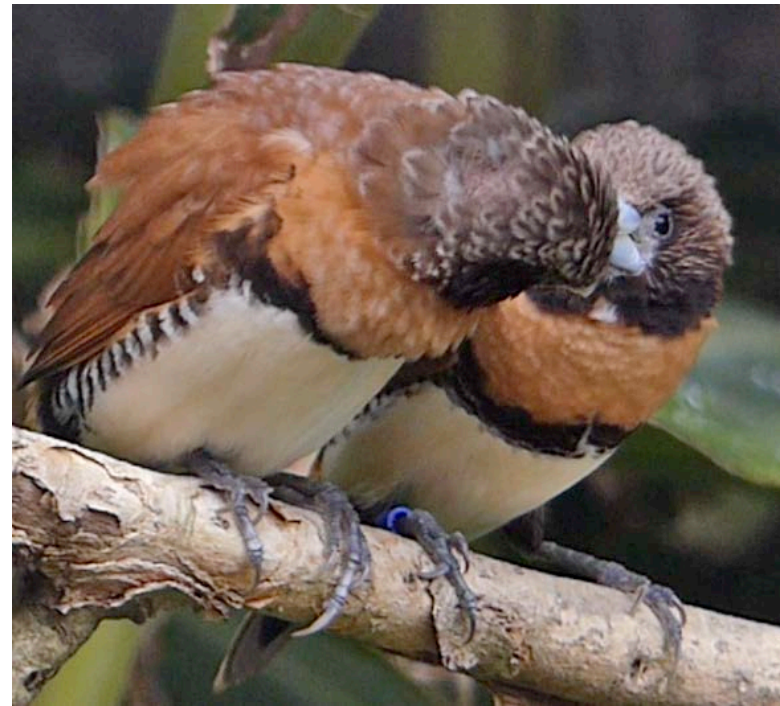
Black-throated finch (*Poephila cincta*)



Chestnut-breasted mannikin (*Lonchura castaneothorax*)

Elevated lower lid while being preened





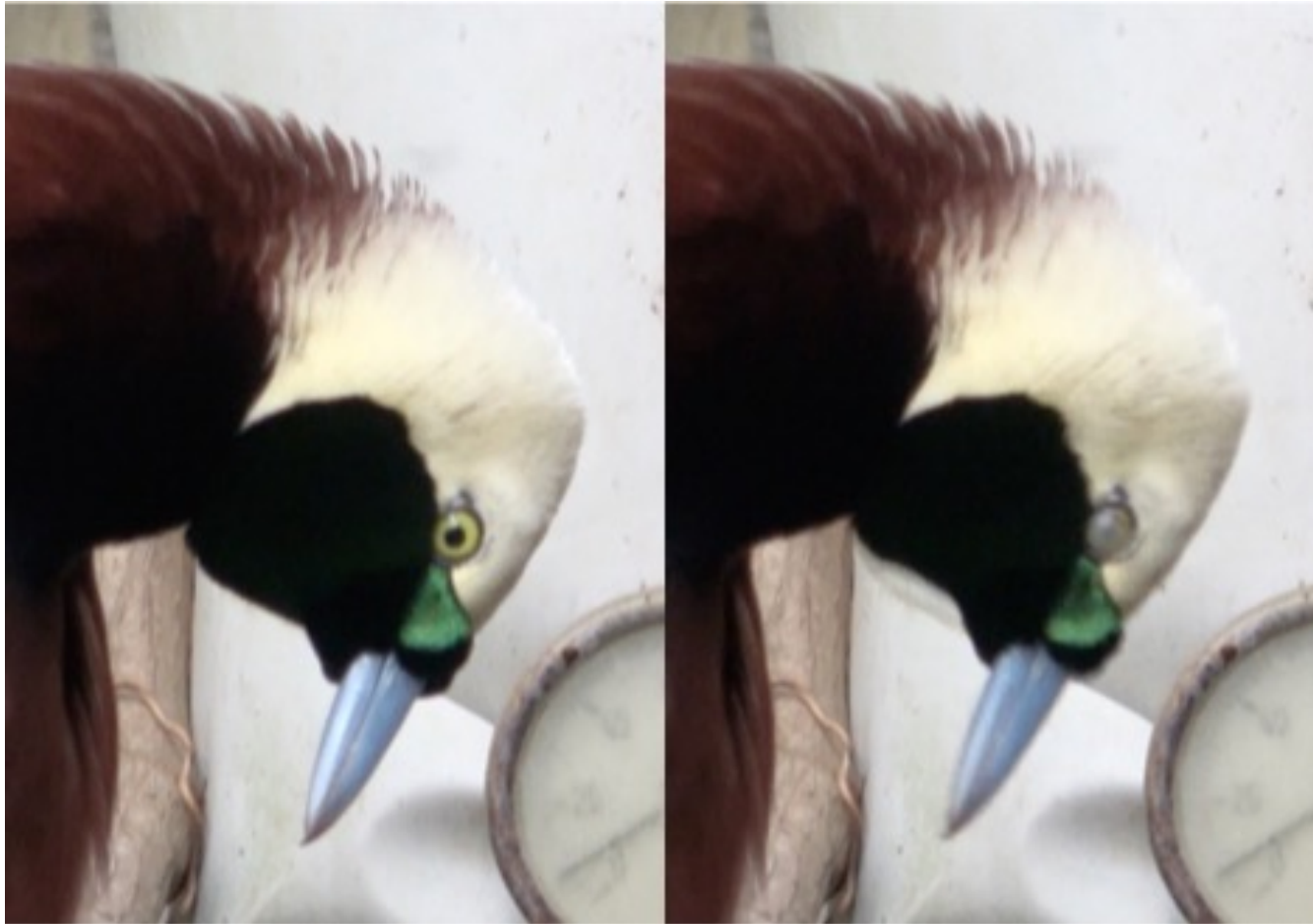
Family Paradisaeidae

Lesser bird-of-paradise (*Paradisaea minor*)

Nictitating membrane blink



Nictitating membrane blink



Greater bird-of-paradise (*Paradisaea apoda*)

Nictitating membrane blink with slight lowering of upper lids



Nictitating membrane blink followed by pupillary constriction



Family Cotingidae

Andean cock-of-the-rock (*Rupicola peruvianus*)

Nictitating membrane blink on head turn



Family Muscicapidae

White-rumped shama (*Copsychus malabaricus*)

Nictitating membrane blink on head turn



Family Thraupidae

Silver-beaked tanager (*Ramphocelus carbo*)

Nictitating membrane blink on head turn



White-lined tanager (*Tachyphonus rufus*)

Nictitating membrane blink on eye movement



Red-crested cardinal (*Paroaria coronata*)



Nictitating membrane blink on head turn



Brazilian tanager (*Ramphocelus bresilius*)



Family Psophodidae

Chiming wedgebill (*Psophodes occidentalis*)

Nictitating membrane blink on head turn



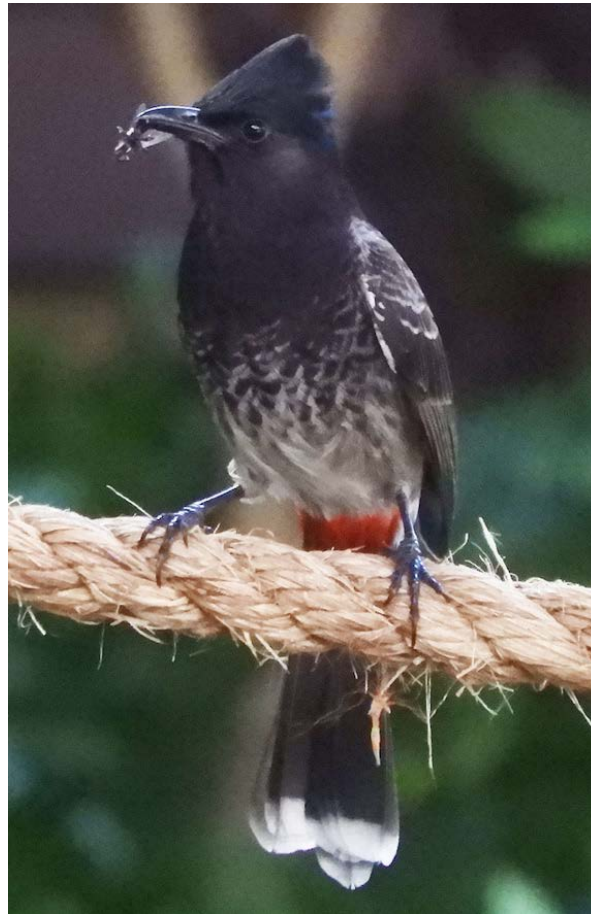
Eastern whipbird (*Psophodes olivaceus*)





Family Pycnonotidae

Red-vented bulbul (*Pycnonotus cafer*)



Red-whiskered bulbul (*Pycnonotus jocosus*)

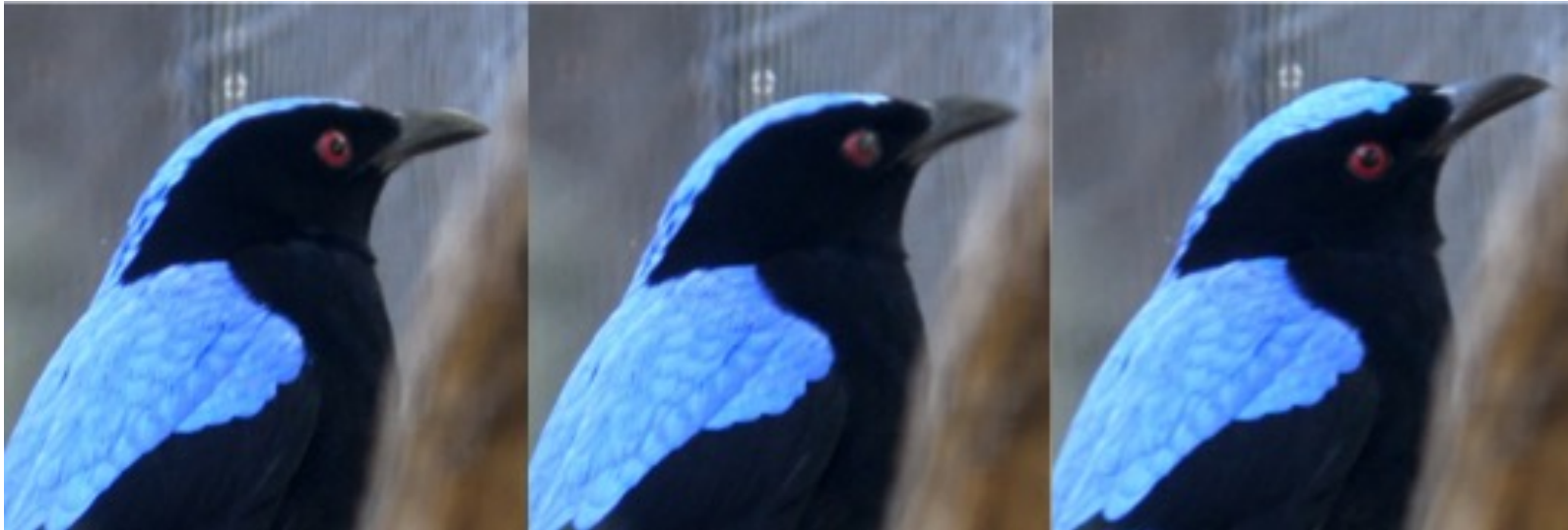


No elevation of lower lid on preening.

Family Irenidae

Asian fairy-bluebird (*Irena puella*)

Nictitating membrane blink on head turn



Family Meliphagidae

Lewin's honeyeater (*Meliphaga lewinii*)

Nictitating membrane blink on head turn





Nictitating membrane blink on head turn



New Zealand bellbird (*Anthornis melanura*)

Nictitating membrane blink on head turn



Blue-faced honeyeater (*Entomyzon cyanotis*)

Nictitating membrane blink on head turn



No lid blink on pecking



Nictitating membrane blink on pecking



Noisy miner (*Manorina melanocephala*)



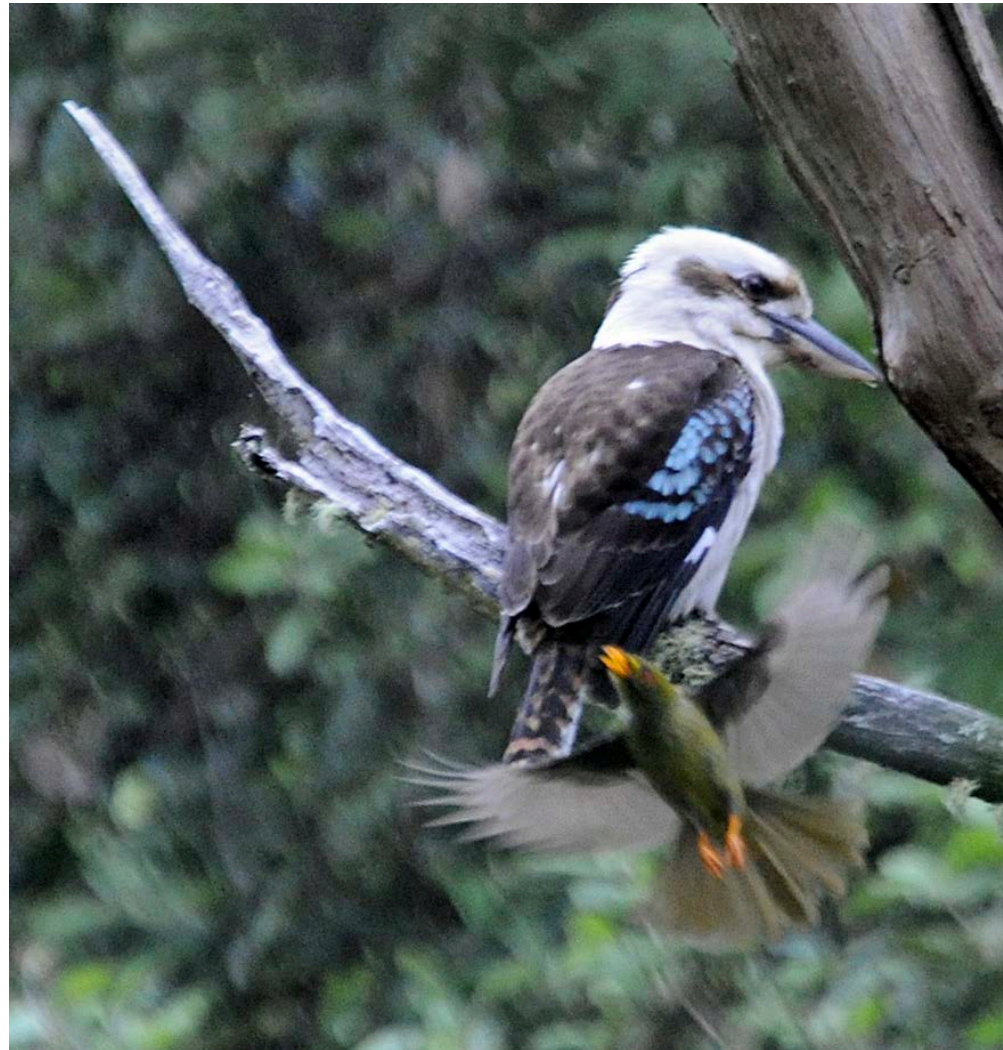
Bell miner (*Manorina melanophrys*)

Nictitating membrane blink





Bell miner mobbing kookaburra



New Holland honeyeater (*Phylidonyris novaehollandiae*)



Striped honeyeater (*Plectorhyncha lanceolata*)



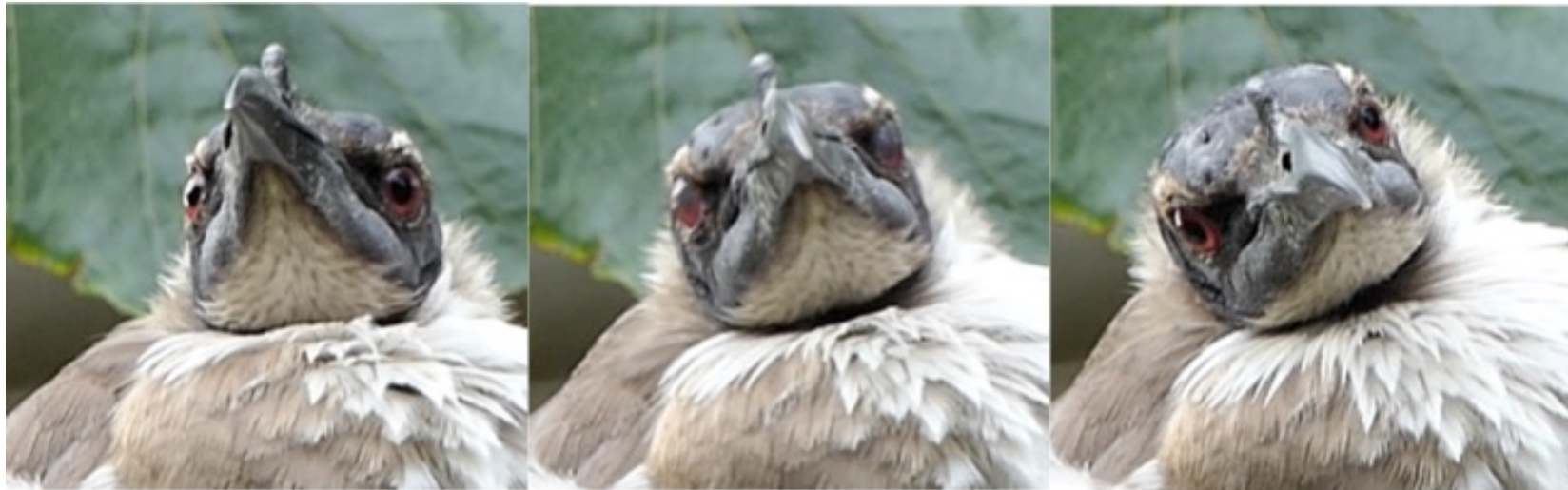
Little friarbird (*Philemon citreogularis*)

Nictitating membrane blink on head turn



Noisy friarbird (*Philemon corniculatus*)

Nictitating membrane blink on head turn





Spiny-cheeked honeyeater (*Acanthagenys rufogularis*)

Nictitating membrane blink on head turn



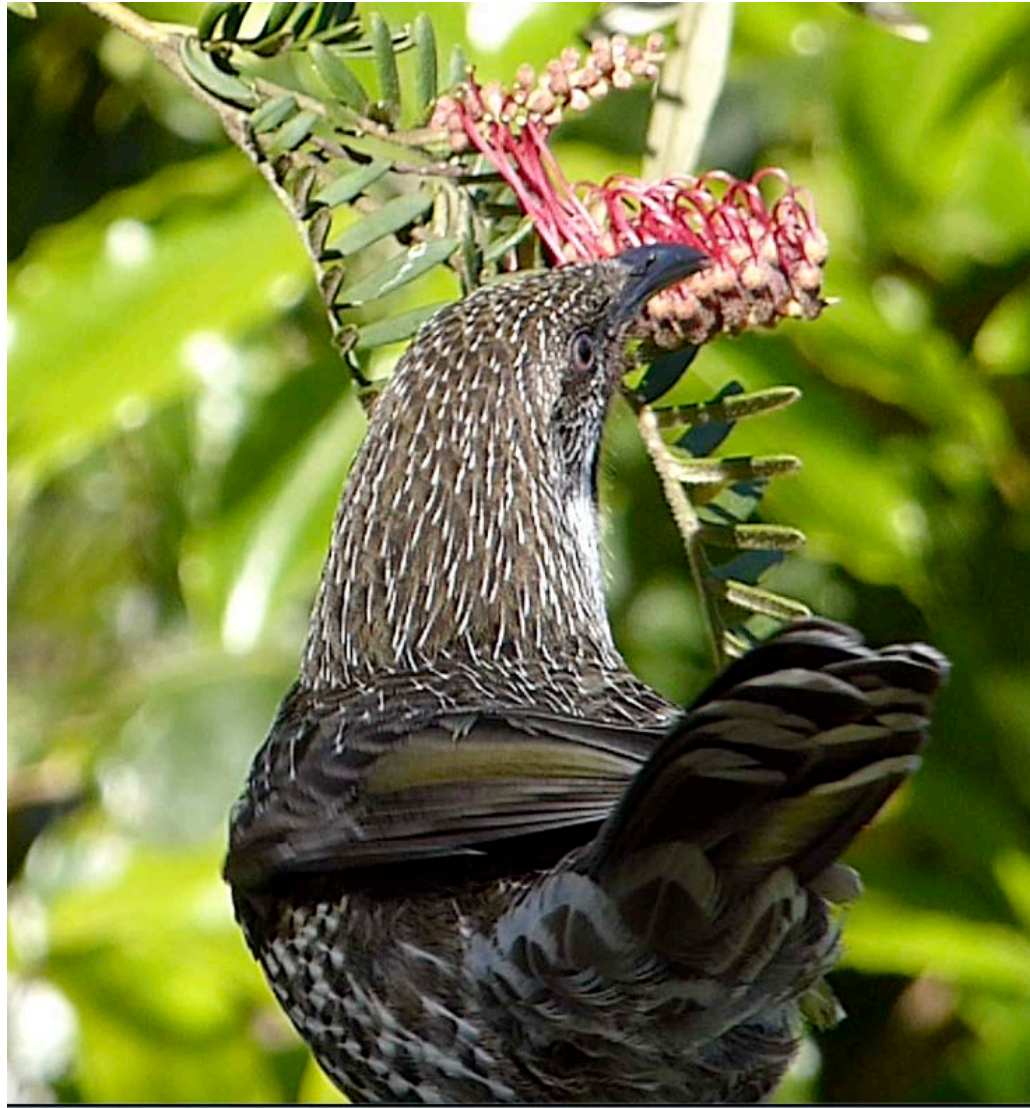
Little wattlebird (*Anthochaera chrysoptera*)

Nictitating membrane blink on head turn



Nictitating membrane blink on head turn





Red wattlebird (*Anthochaera carunculata*)

Nictitating membrane blink on head turn



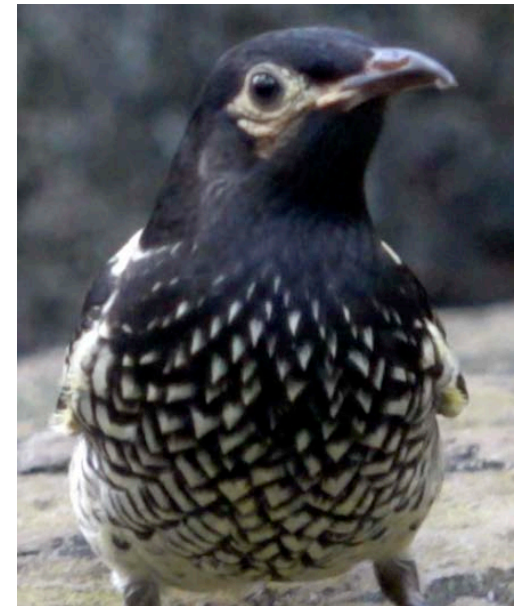
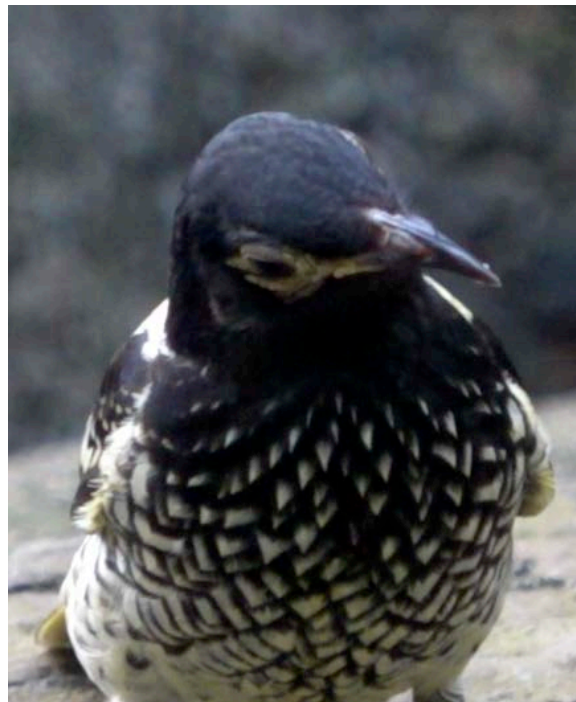
Yellow wattlebird (*Anthochaera paradoxa*)



Yellow-tufted honeyeater (*Lichenostomus melanops*)

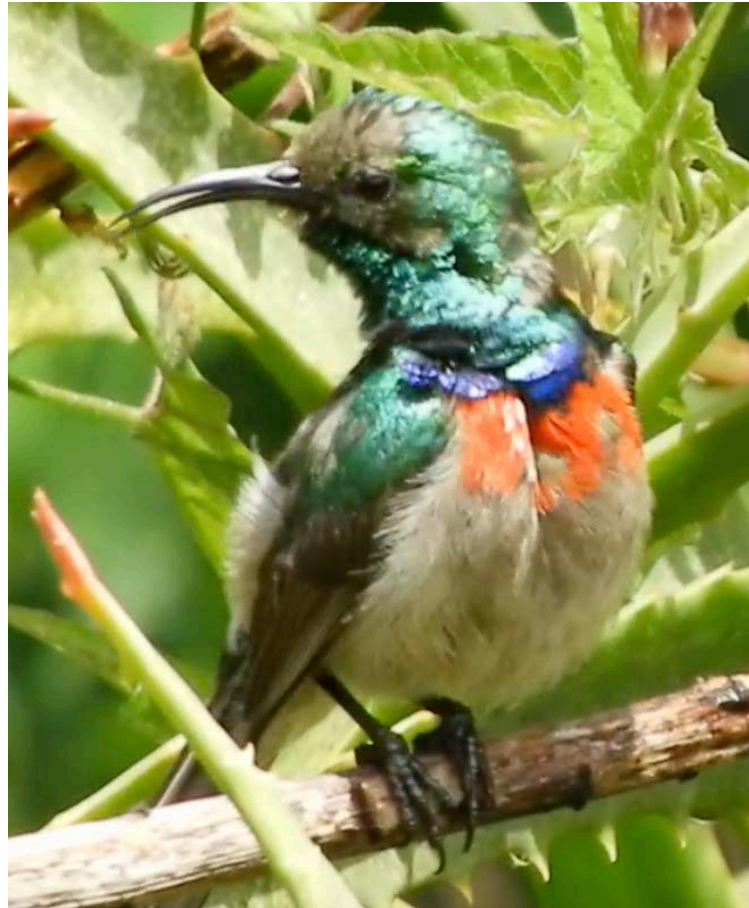


Regent honeyeater (*Anthochaera phrygia*)



Family Nectariniidae

Southern double-collared sunbird (*Cinnyris chalybeus*)



Buff-throated sunbird (*Chalcomitra adelberti*)

Nictitating membrane blink on head turn



Splendid sunbird (*Cinnyris coccinigastrus*)



Olive-backed sunbird (*Cinnyris jugularis*)



Family Callaeidae

North Island kōkako (*Callaeas wilsoni*)

Nictitating membrane blink on head turn



Family Oriolidae

Australasian figbird (*Sphecotheres vieilloti*)

Nictitating membrane blink on head turn



Female. Nictitating membrane blink on head turn







Green figbird (*Sphecotheres viridis*)

Female. Nictitating membrane blink on eye movement



African golden oriole (*Oriolus auratus*)

Nictitating membrane blink on head turn



Black-naped oriole (*Oriolus chinensis*)

Nictitating membrane blink with slight lowering of inner part of upper lid, on head turn



Olive-backed oriole (*Oriolus sagittatus*)

Nictitating membrane blink



Family Oreoicidae

Crested bellbird (*Oreoica gutturalis*)

Nictitating membrane blink on head turn



Family Petroicidae

Eastern yellow robin (*Eopsaltria australis*)

Nictitating membrane blink on preening



Family Ptilonorhynchidae

Regent bowerbird (*Sericulus chrysocephalus*)

Female. Nictitating membrane blink on head turn



Male. No definite blink on pecking



Nictitating membrane blink on head turn





Satin bowerbird (*Ptilonorhynchus violaceus*)

Male. No blink on pecking



Nictitating membrane blink on head turn



Female. Nictitating membrane blink on head turn









Green catbird (*Ailuroedus crassirostris*)

Nictitating membrane blink











Family Corcoracidae

White-winged chough (*Corcorax melanorhamphos*)

Nictitating membrane blink on head turn



Apostlebird (*Struthidea cinerea*)

Nictitating membrane blink





Lower lid elevation with drowsiness



Lower lid and nictitating membrane blink with drowsiness





Family Oriolidae

Green oriole (*Oriolus flavocinctus*)



Family Maluridae

Superb fairywren (*Malurus cyaneus*)



Splendid fairywren (*Malurus splendens*)



Variegated fairywren (*Malurus lamberti*)









Purple-crowned fairywren (*Malurus coronatus*)

Nictitating membrane blink





Family Rhipiduridae

Willy Wagtail (*Rhipidura leucophrys*)

Nictitating membrane blink









Grey fantail (*Rhipidura albiscapa*)



Family Pachycephalidae

Grey shrike-thrush (*Colluricincla harmonica*)



'Anting'.



Rufous whistler (*Pachycephala rufiventris*)

Nictitating membrane blink on head turn



Australian golden whistler (*Pachycephala pectoralis*)

Nictitating membrane blink on head turn



White-browed babbler (*Pomatostomus superciliosus*)







Family Zosteropidae

Silvereye (*Zosterops lateralis*)



Nictitating membrane blink on head turn



Nictitating membrane blink with elevation of lower lid

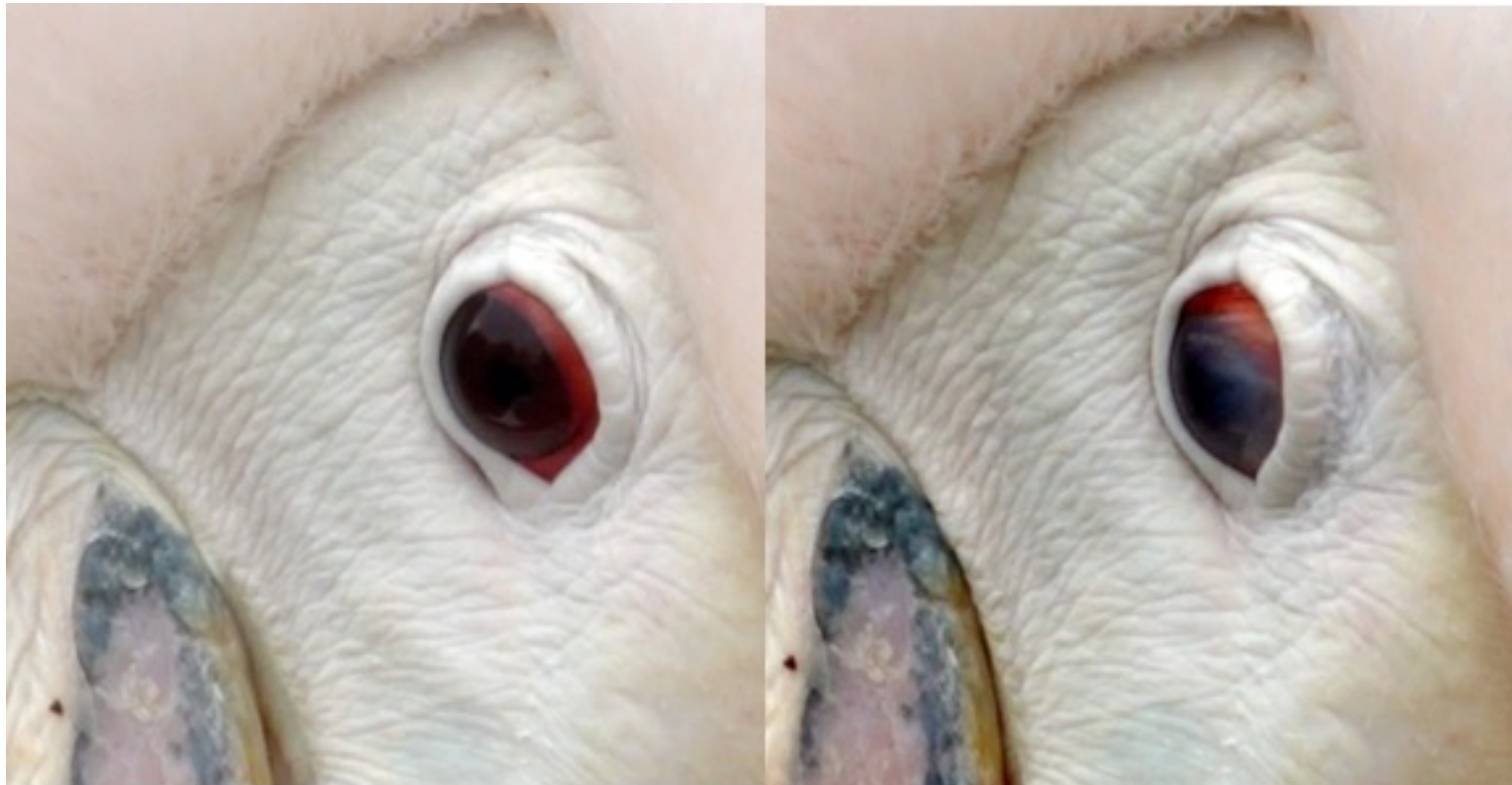


Order Pelecaniformes

Family Pelecanidae

Great white pelican (*Pelecanus onocrotalus*)

Nictitating membrane blink with downward gaze



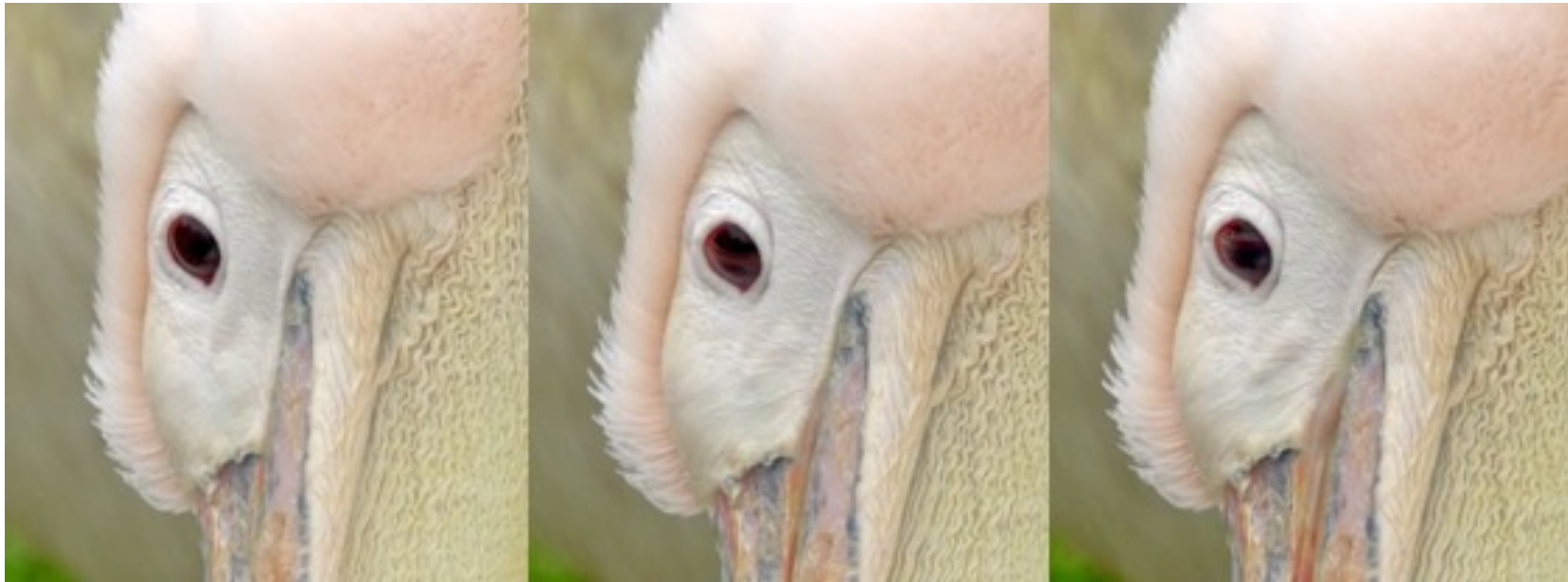
Nictitating membrane blink with eye movement



Eye movement



Nictitating membrane blink



Nictitating membrane blink with eye movement



Nictitating membrane blink with slight lowering of inner part of upper lid



Nictitating membrane blink with elevation of lower lid with drowsiness



Nictitating membrane blink with slight lowering of inner part of upper lid



Nictitating membrane blink with slight lowering of inner part of upper lid on eye movement



Peruvian pelican (*Pelecanus thagus*)

Nictitating membrane blink with lowering of the upper lid



Australian pelican (*Pelecanus conspicillatus*)

Nictitating membrane blink





Nictitating membrane blink on eye movement



No lid blink on preening



Brown pelican (*Pelecanus occidentalis*)

Nictitating membrane blink with slight lowering of inner part of upper lid



Eye movement



Lower lid elevation with preening





Dalmatian pelican (*Pelecanus crispus*)

Nictitating membrane blink on preening



Nictitating membrane and lower lid blink with preening



Nictitating membrane blink with slight lowering of inner part of upper lid



Nictitating membrane blink on eye movement



Family Threskiorthithidae

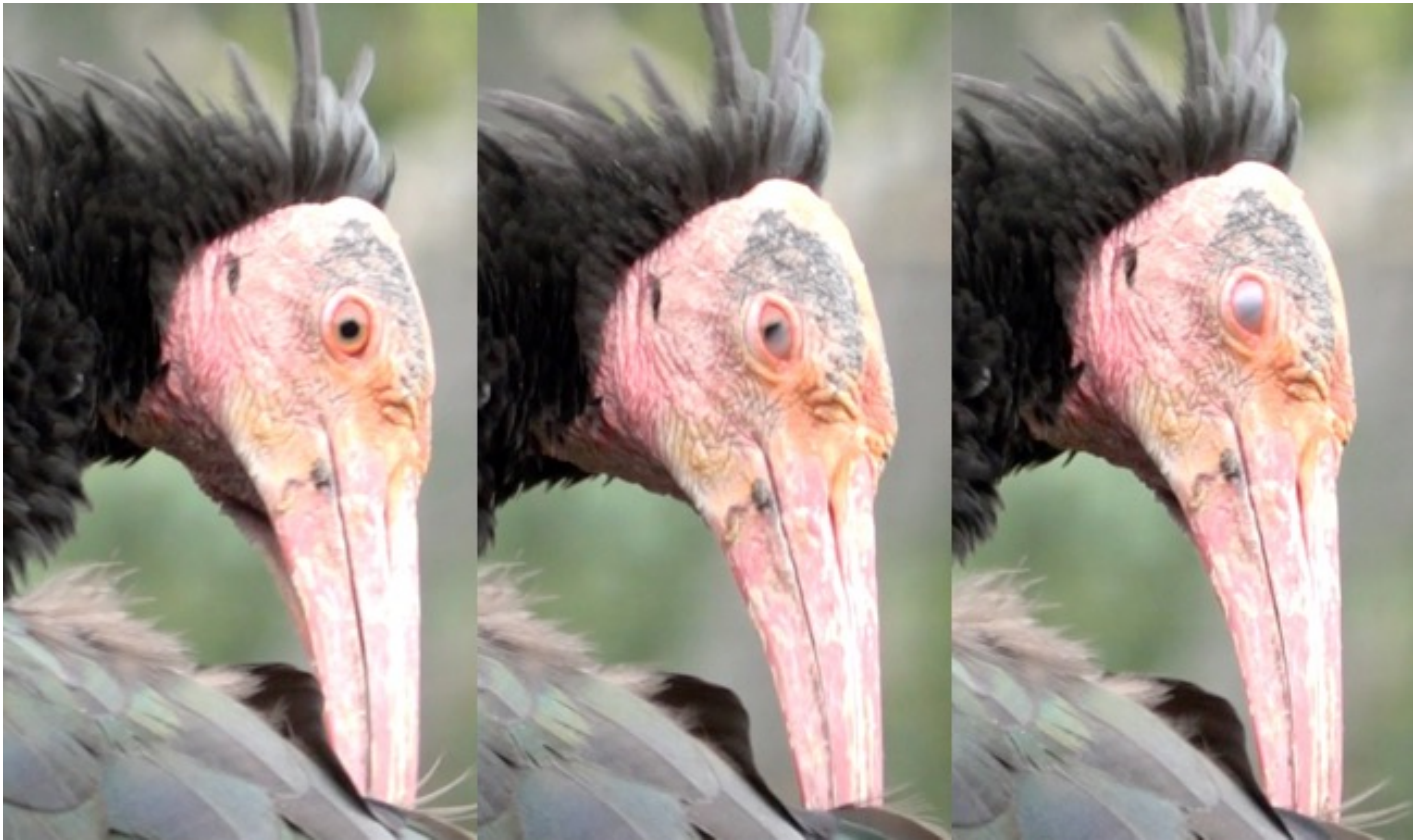
Southern bald ibis (*Geronticus calvus*)

Nictitating membrane blink

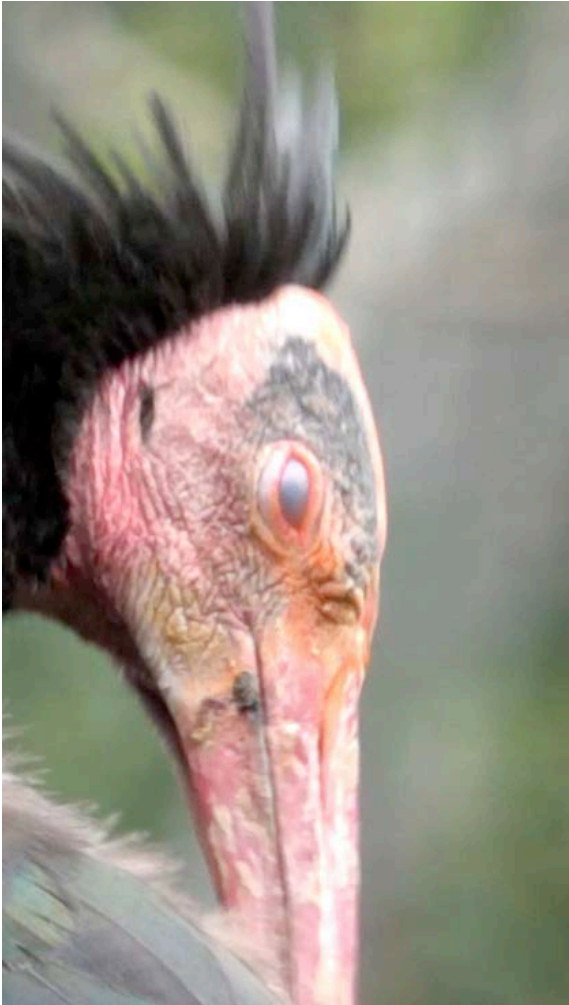


Northern bald ibis or waldrapp (*Geronticus eremita*)

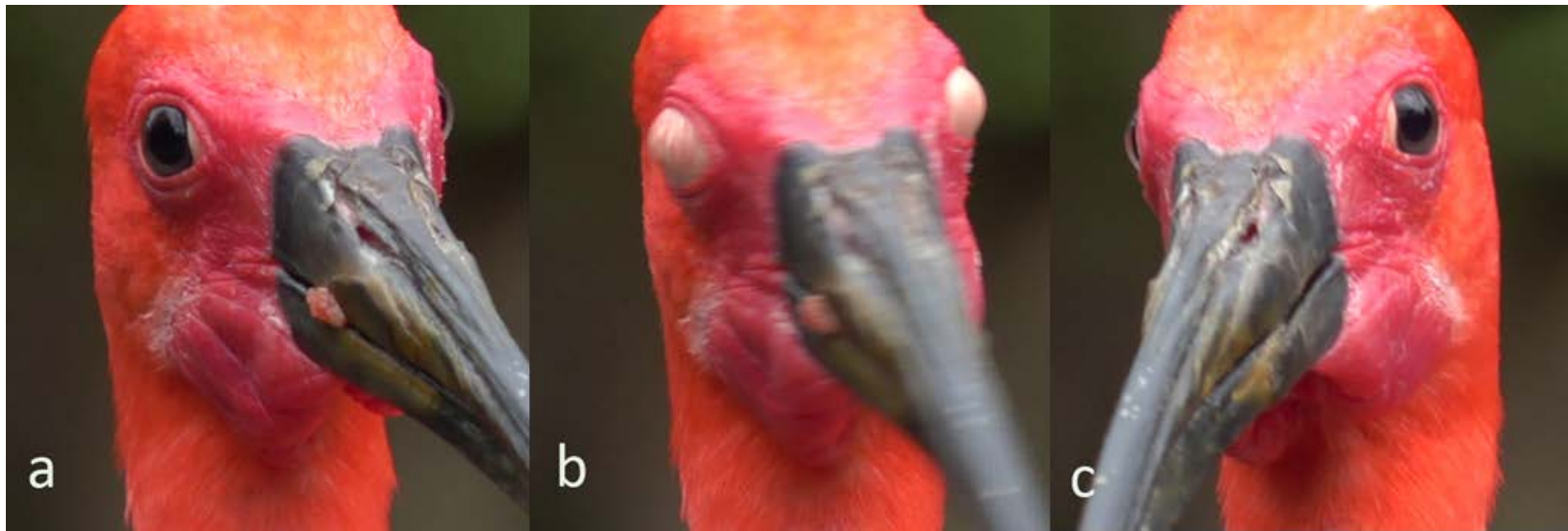
Nictitating membrane blink with elevation of lower lid and depression of inner part of upper lid



Nictitating membrane with and without narrowing of palpebral fissure



Scarlet ibis (*Eudocimus ruber*)
Vascular nictitating membranes



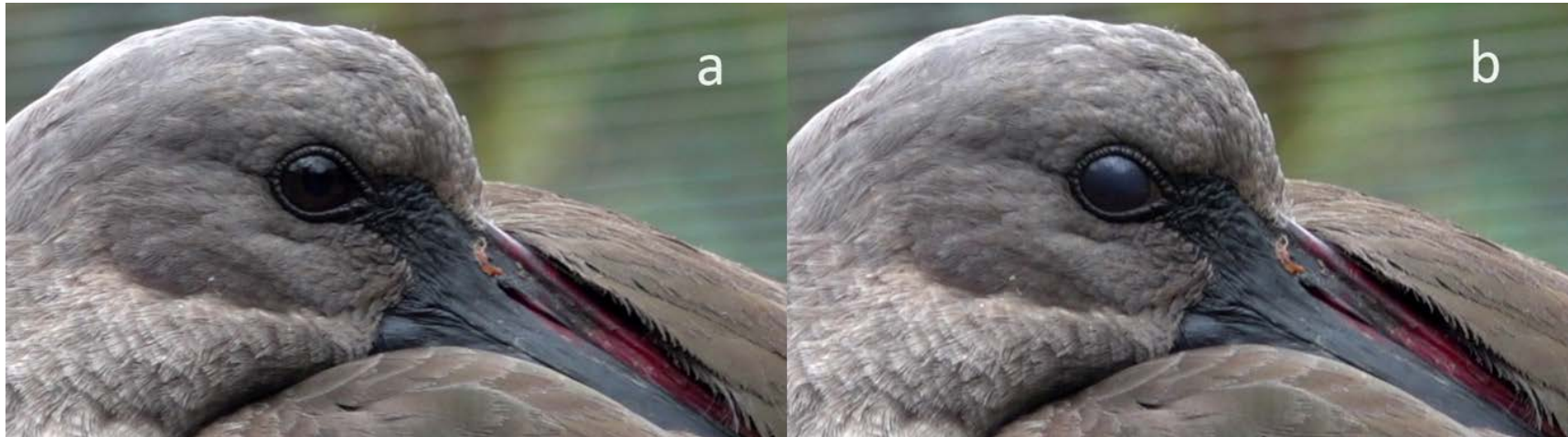
a) Pre-blink. b) Both eyes covered by white opaque nictitating membranes with visible fine blood vessels. c) Post-blink at end of head turn.





Hadada ibis (*Bostrychia hagedash*)

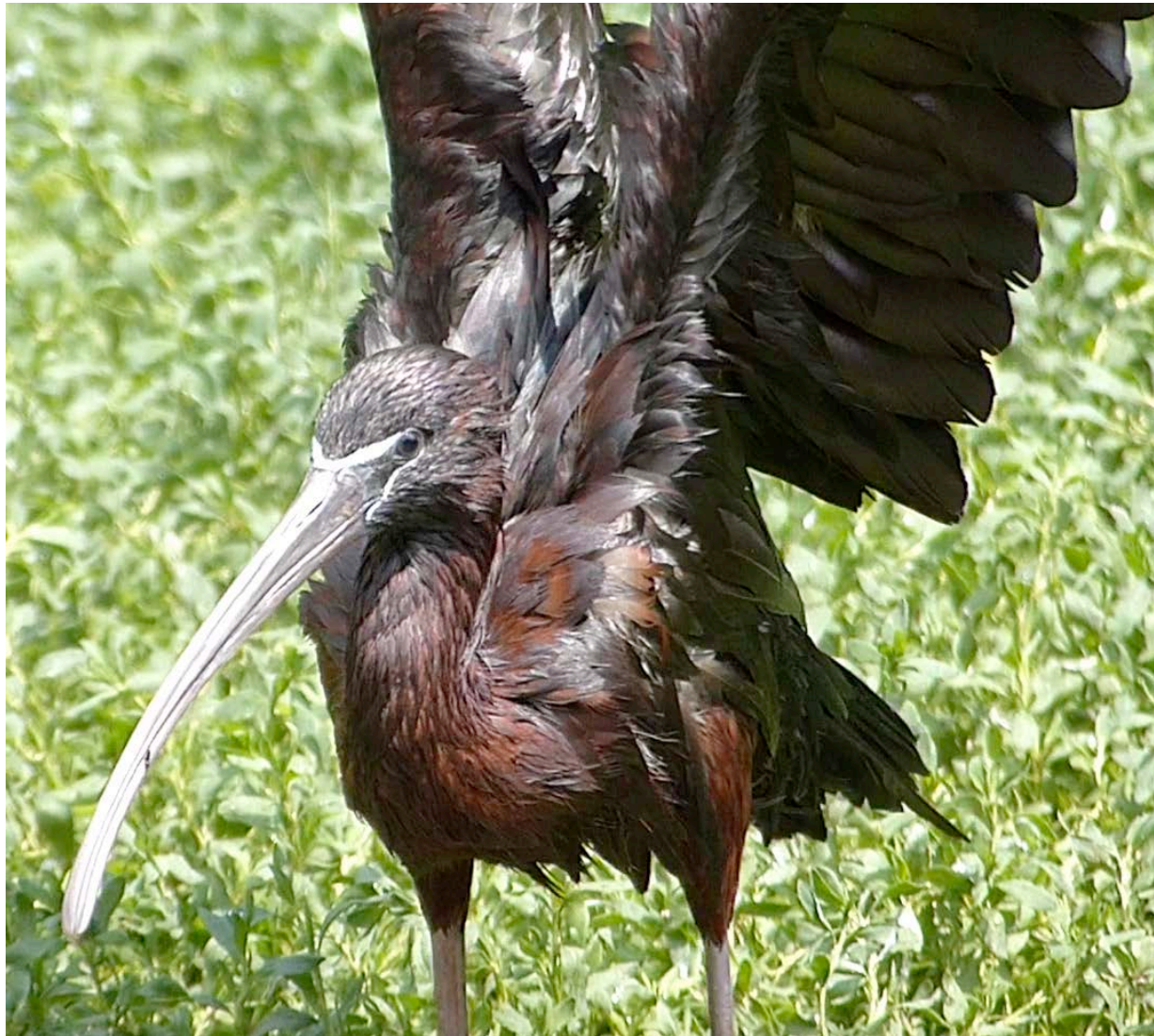
Nictitating membrane blink



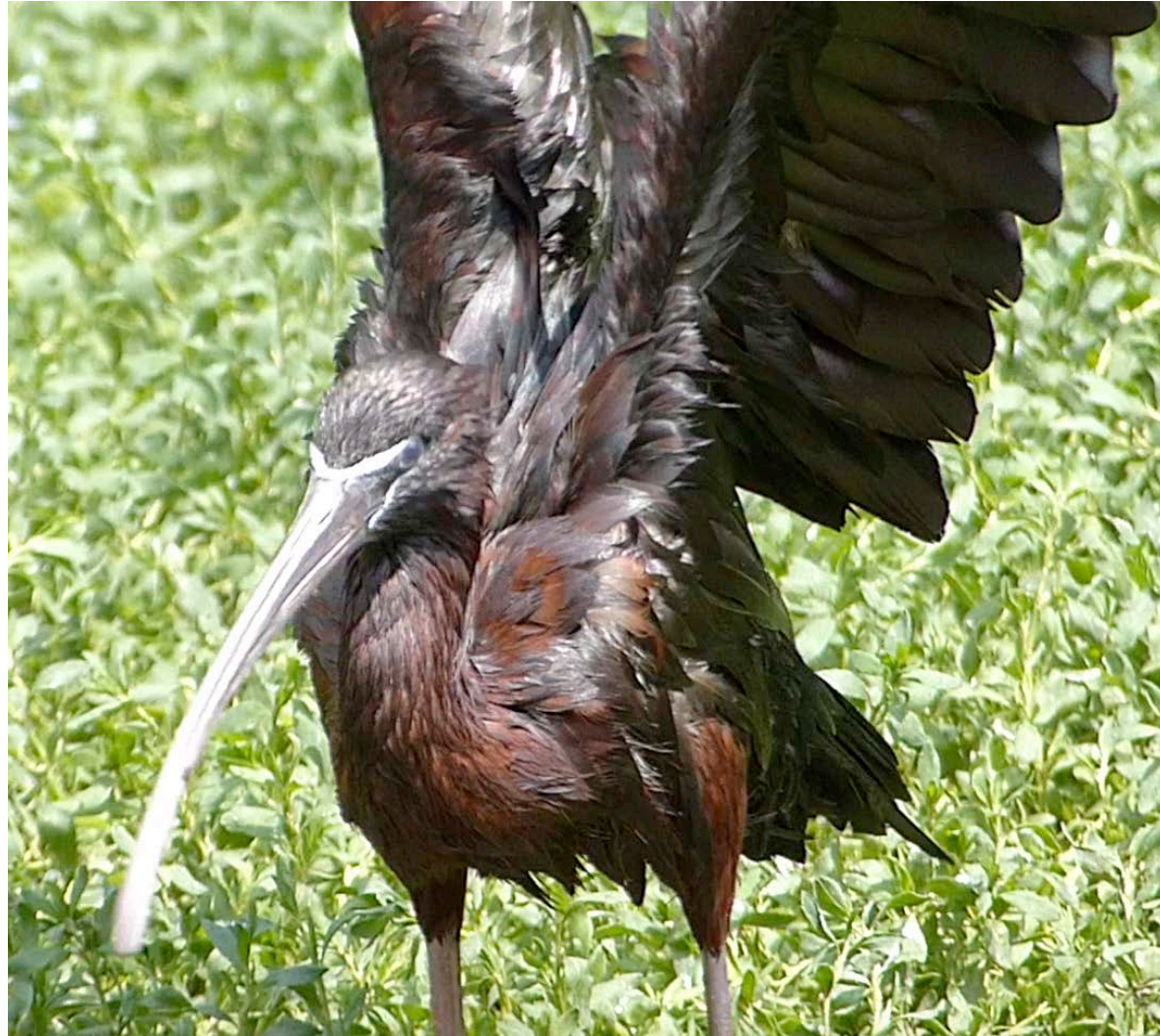
Glossy ibis (*Plegadis falcinellus*)

Nictitating membrane and lower lid elevation on preening





Nictitating membrane blink



Black-faced ibis (*Theristicus melanopis*)

Nictitating membrane blink with upper lid becoming more prominent



Buff-necked ibis (*Theristicus caudatus*)

Nictitating membrane blink



Australian white ibis (*Threskiornis molucca*)

No sustained blink on pecking



No blink on preening



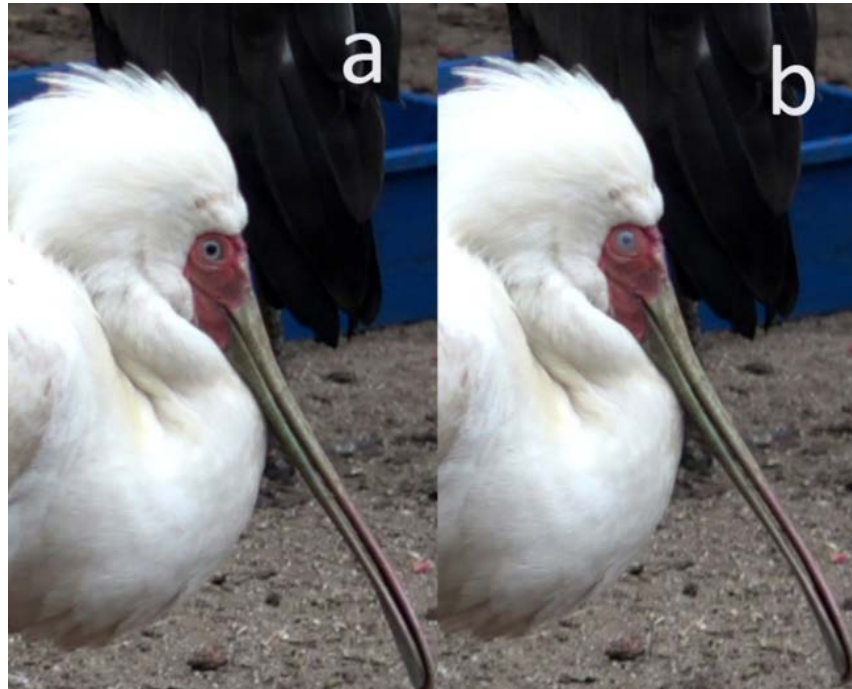
Nictitating membrane blink with slight lowering of inner part of upper lid



Vascular nictitating membrane



African spoonbill (*Platalea alba*)
Nictitating membrane blink on head turn



No lid blink on preening



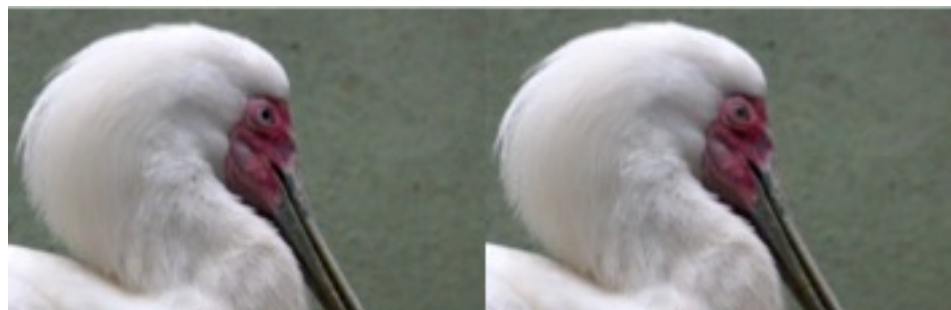
Nictitating membrane blink



Nictitating membrane blink on eye movement



Nictitating membrane blink on head movement



Roseate spoonbill (*Platalea ajaja*)
Nictitating membrane blink on head turn



Royal spoonbill (*Platalea regia*)

Nictitating membrane blink on eye movement



Nictitating membrane blink with slight lowering of upper lid



Nictitating membrane blink on eye movement



Translucent nictitating membrane







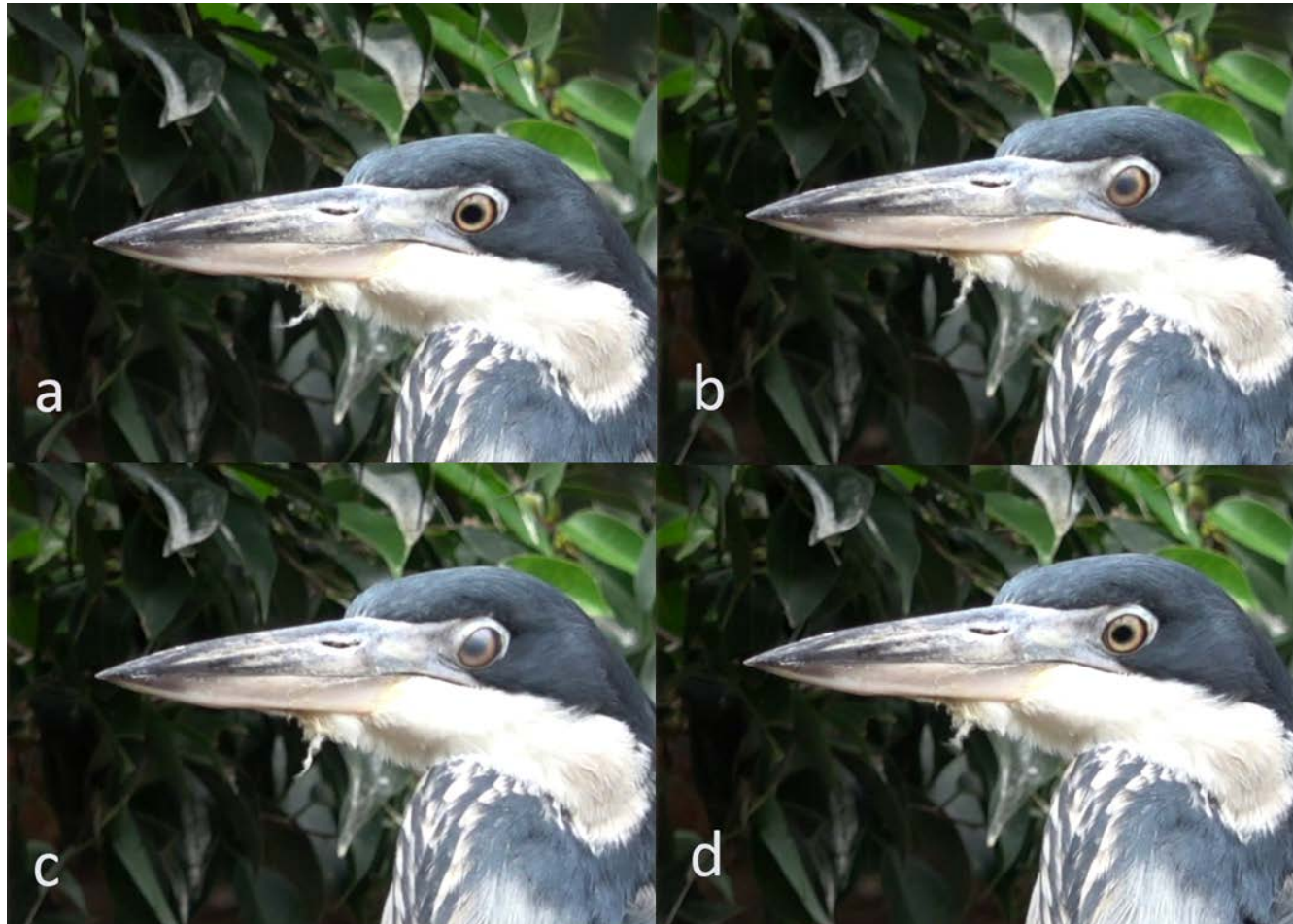




Family Ardeidae

Black-headed heron (*Ardea melanocephala*)

Nictitating membrane blin



a) Pre-blink. b) Inner part of upper lid has pulled down slightly and semi-transparent nictitating membrane has covered pupil. c) Maximal blink. d) Post blink.



*Nictitating
membrane
blink on
head turn.
Inner
canthus
pulled
across the
eye a little.*



a) Pre-blink. b) Semi-transparent nictitating membrane has covered both pupils. c) Post blink after minimal head movement.



Juvenile black-headed heron begging.

Grey heron (*Ardea cinerea*)

Nictitating membrane blink with slight lowering of nasal part of upper lid

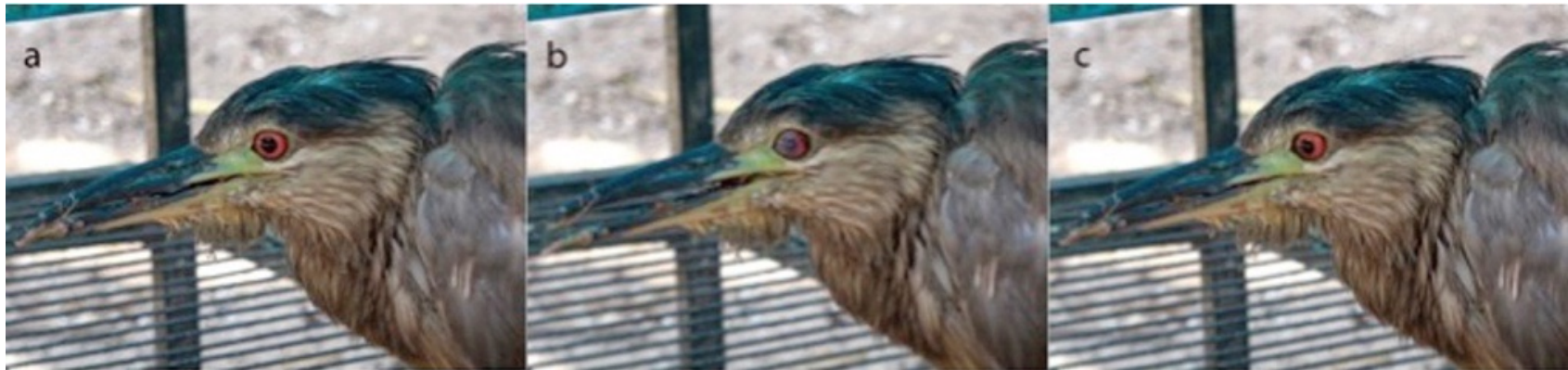


Purple heron (*Ardea purpurea*)

Nictitating membrane blink with head still. Inner canthus pulled across the eye a little



Black-crowned night heron (*Nycticorax nycticorax*)



Juvenile. a) Pre-blink. b) Semi-transparent nictitating membrane has covered left eye. c) Post-blink after minimal head and eye movement.

Nictitating membrane blink on head movement



Nictitating membrane blink on head movement





Elevation of lower lid with preening





Nankeen night heron (*Nycticorax caledonicus*)



Nictitating membrane blink on eye movement



Nictitating membrane blink and pupillary constriction on eye movement



Cattle egret (*Bubulcus ibis*)

Nictitating membrane blink on head movement. Slight lowering of inner part of upper lid





*Juvenile.
Nictitating
membrane
blink on head
movement.
Slight
lowering of
inner part of
upper lid.*

No lid blink on pecking

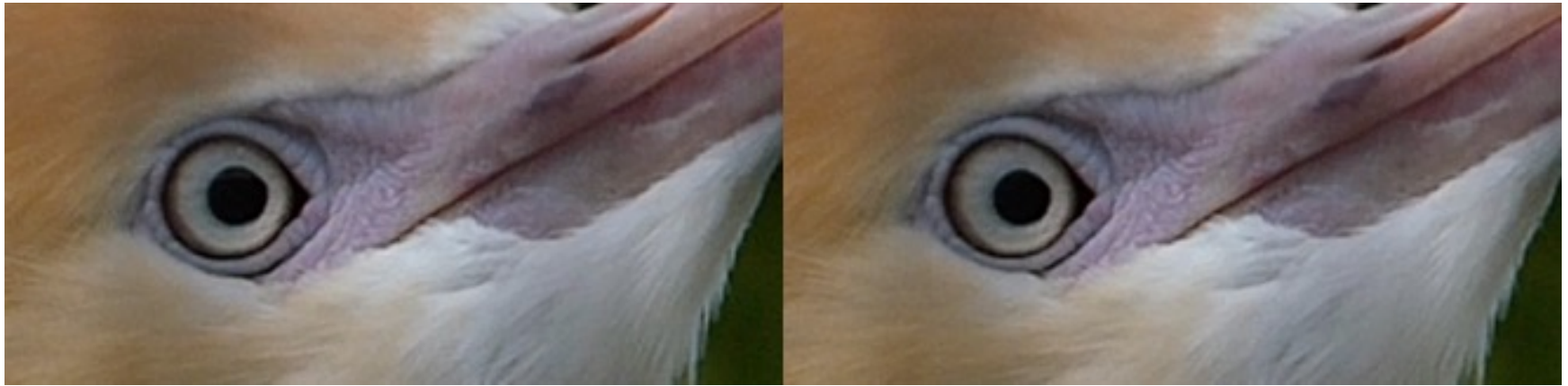


Nictitating membrane blink on head movement. Slight lowering of inner part of upper lid





Eye movement



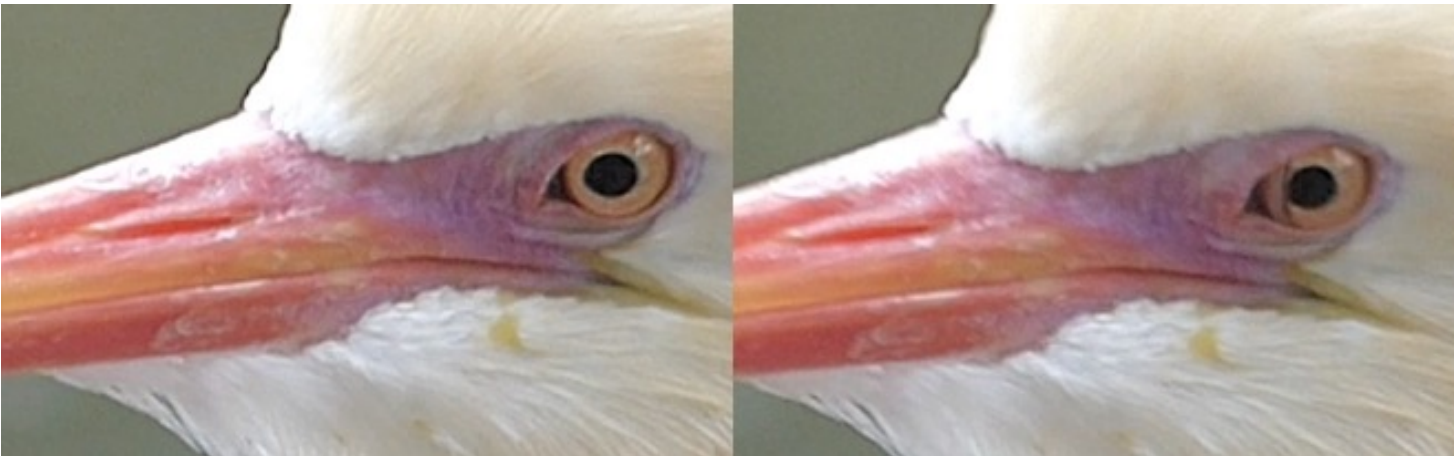
Slight rise in lower lid with preening



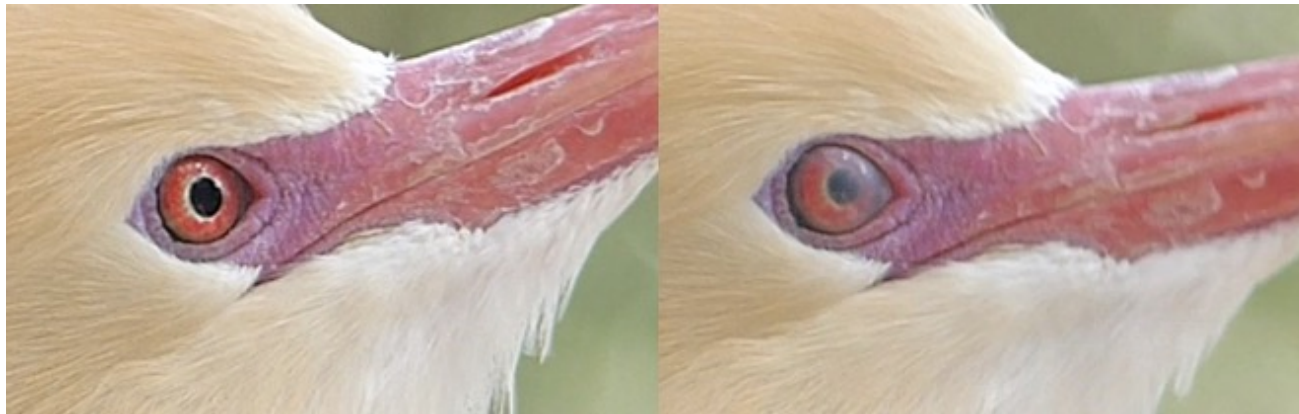
Nictitating membrane blink on head movement. Slight lowering of inner part of upper lid



Nictitating membrane blink on head movement



Nictitating membrane wink on head movement



Little egret (*Egretta garzetta*)

Nictitating membrane blink with lowering of the inner part of the upper lid





Pacific reef heron (*Egretta sacra*)

Nictitating membrane blink on head movement



Prominent eye

Pied heron (*Egretta picata*)

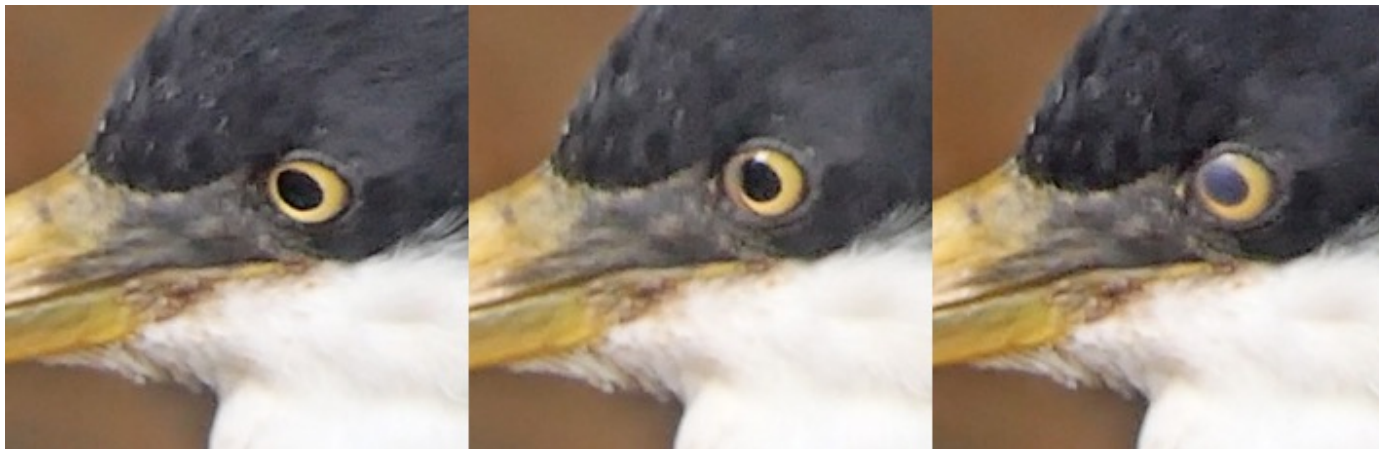
Nictitating membrane blink on head movement



Nictitating membrane blink on eye movement



Nictitating membrane blink









Nictitating membrane blink with slight lowering of inner part of upper lid



White-faced heron (*Egretta novaehollandiae*)

Nictitating membrane blink on head movement. Slight lowering of inner part of upper lid





*Nictitating
membrane
blink on
head
movement.
Slight
lowering of
inner part of
upper lid.*

Grey heron (*Ardea cinerea*)

Nictitating membrane blink on head movement. Slight lowering of inner part of upper lid



Nictitating membrane blink on head movement. Slight lowering of inner part of upper lid



Nictitating membrane blink on head movement. Slight lowering of inner part of upper lid



Nictitating membrane blink on eye movement. Slight lowering of inner part of upper lid



Family Scopidae

Hamerkop (*Scopus umbretta*)

Nictitating membrane blink on head movement





Nictitating membrane blink on preening



Nictitating membrane blink on head movement



Nictitating membrane blink on head movement



Infraclass Palaeognathae

Order Casuariiformes

Family Casuariidae

Emu (*Dromaius novaehollandiae*)



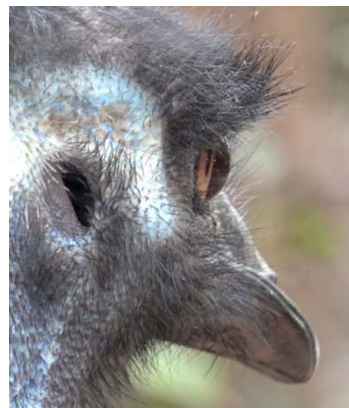
Nictitating membrane blink on head movement

Elevation of lower lid with exposure of nictitating membrane









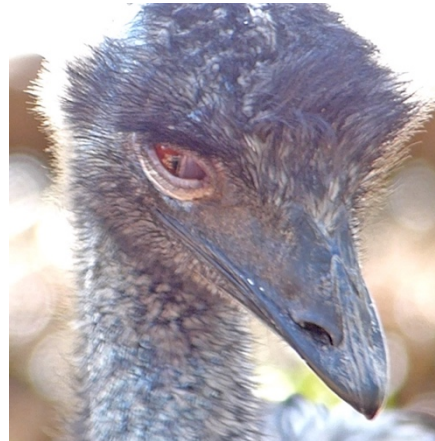
Deep cornea

Juvenile





Elevation of lower lid



Family Casuariidae

Southern cassowary (*Casuarius casuarius*)

Nictitating membrane blink





Lower lid elevation with drowsiness



Vascular nictitating membrane

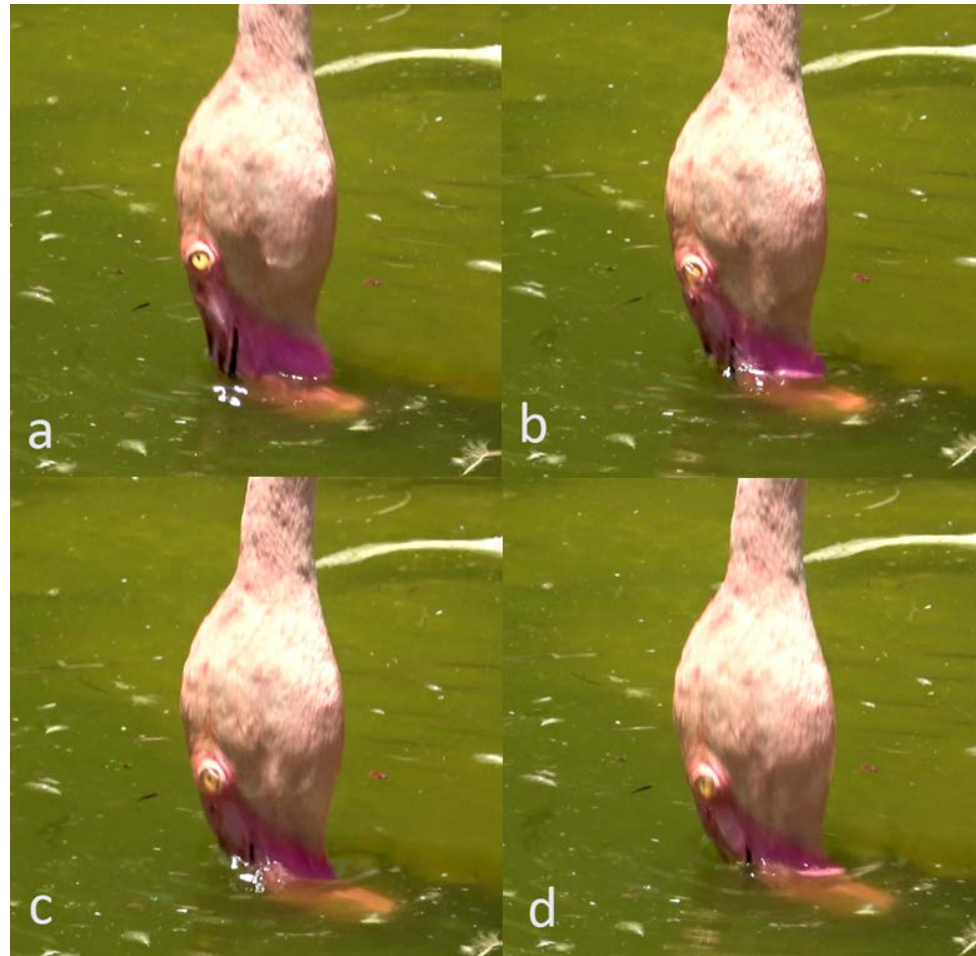




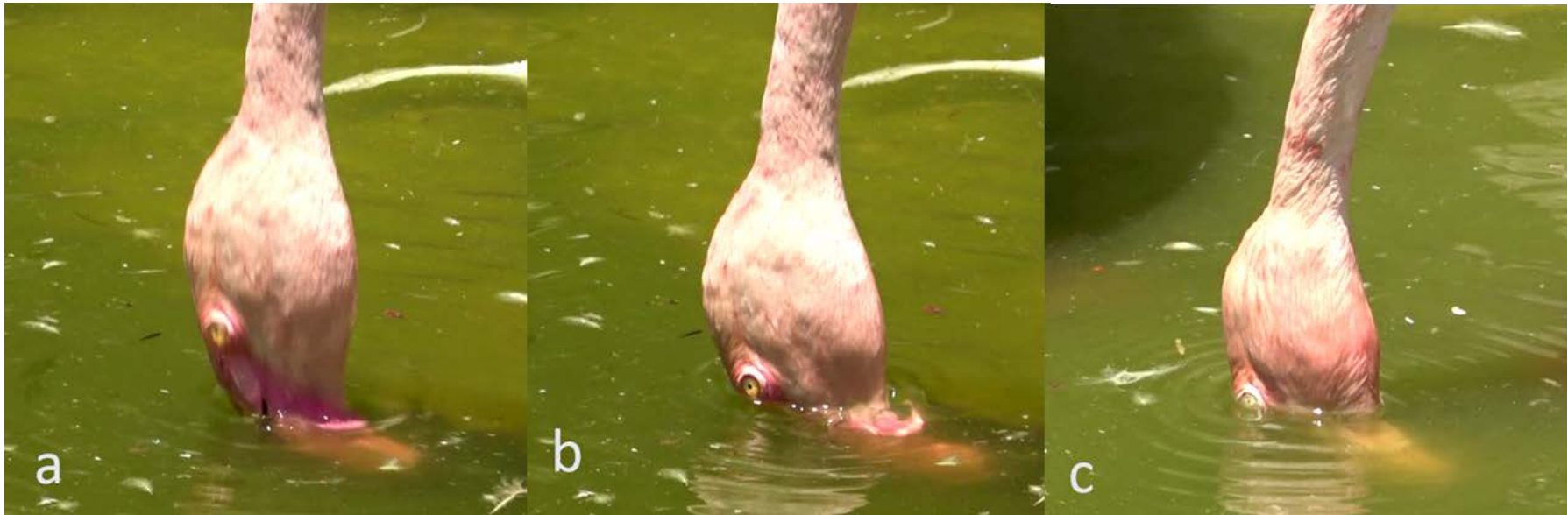
Order Phoenicopteriformes

Family Phoenicopteridae

Chilean flamingo (*Phoenicopus chilensis*)



Feeding. a) Pre-blink. b) and c) Nictitating membrane blink. Transparent membrane. d) Post blink. This was the only blink captured in multiple dips of the head into the water.



Chilean flamingo (Phoenicopterus chilensis) feeding. a) Lowering its head into the water. b) Reaches the water. c) Eye partially immersed in water. It did not blink on entering the water.

American flamingo (*Phoenicopterus ruber*)

Nictitating membrane blink with elevation of lower lid on preening



It did not usually blink either before or after straining the water for particles.



Eye turned down during preening



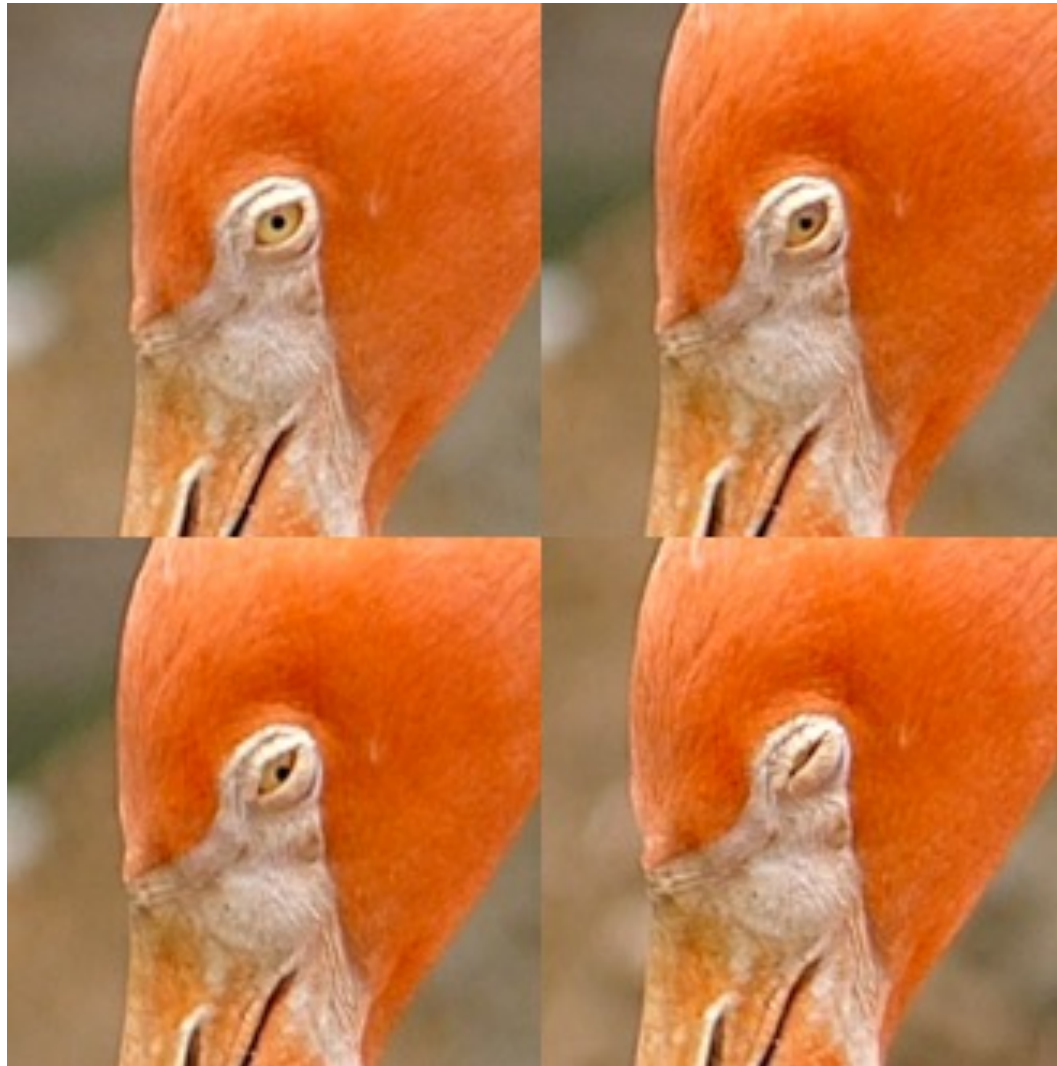
Eye turned down during preening



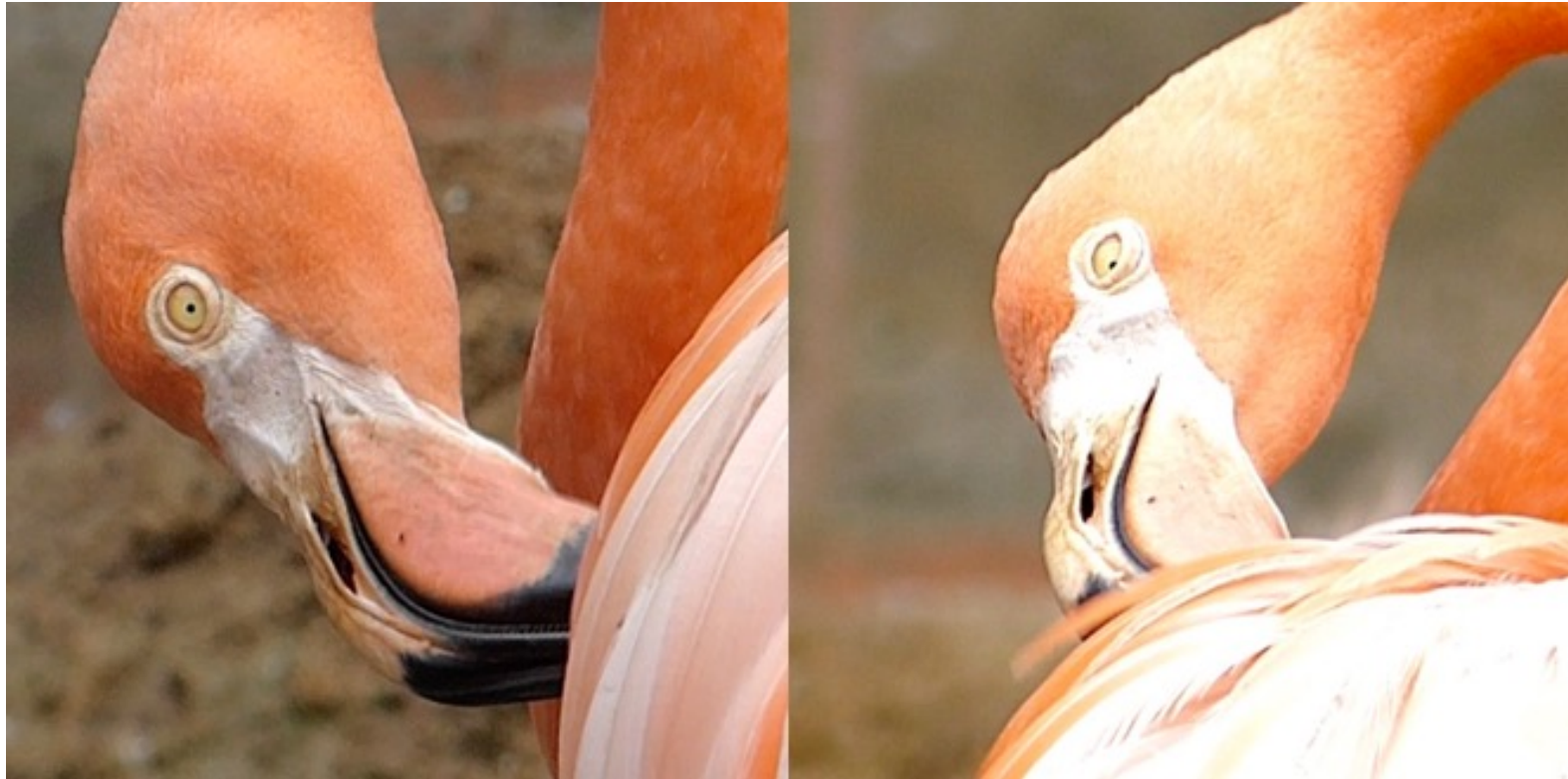
Lower lid elevation with drowsiness



Nictitating membrane then lower lid elevation with drowsiness



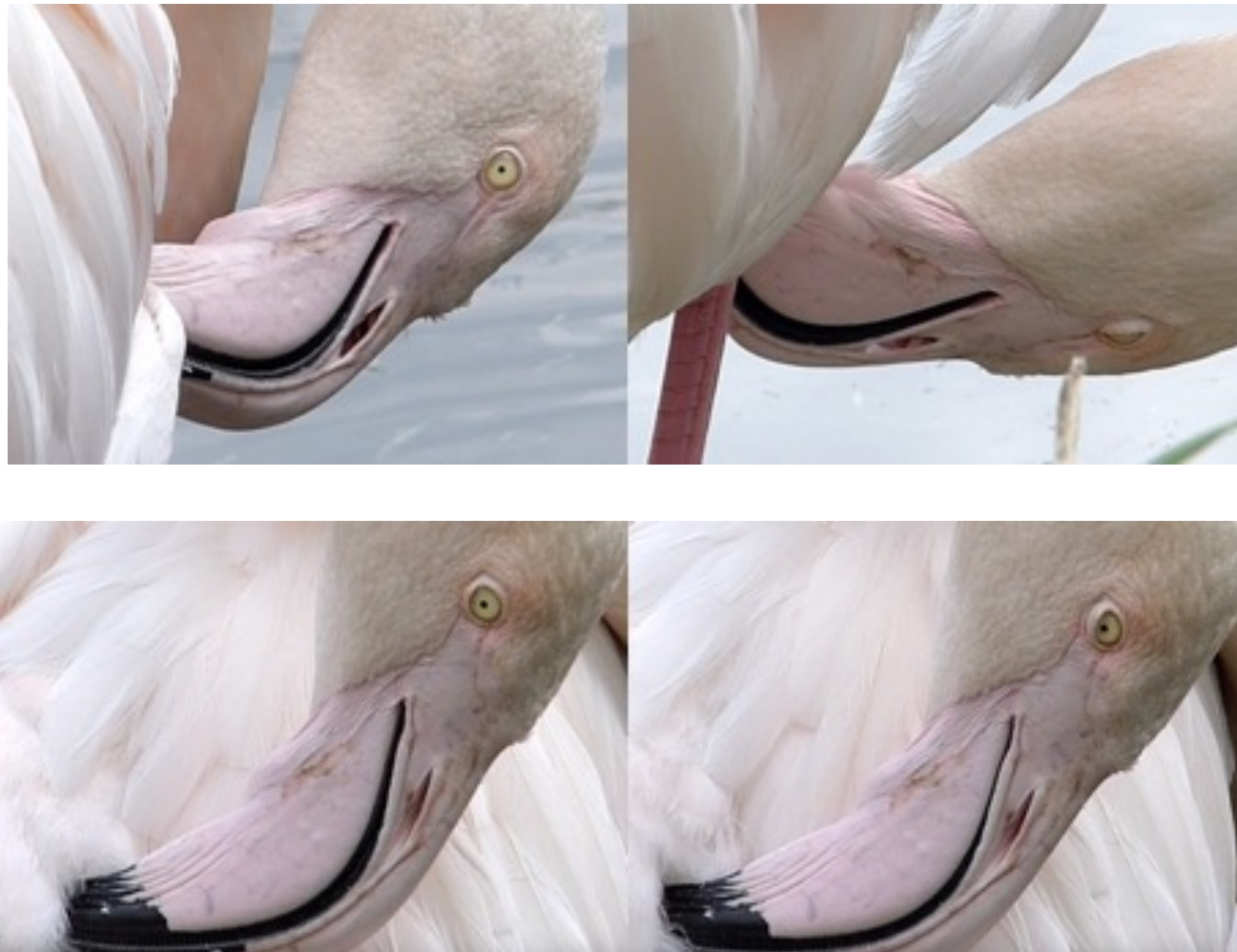
Intermittent elevation of lower lid with preening



Greater flamingo (*Phoenicopterus roseus*)



Intermittent elevation of lower lid with preening



Nictitating membrane blink with ?slight globe retraction



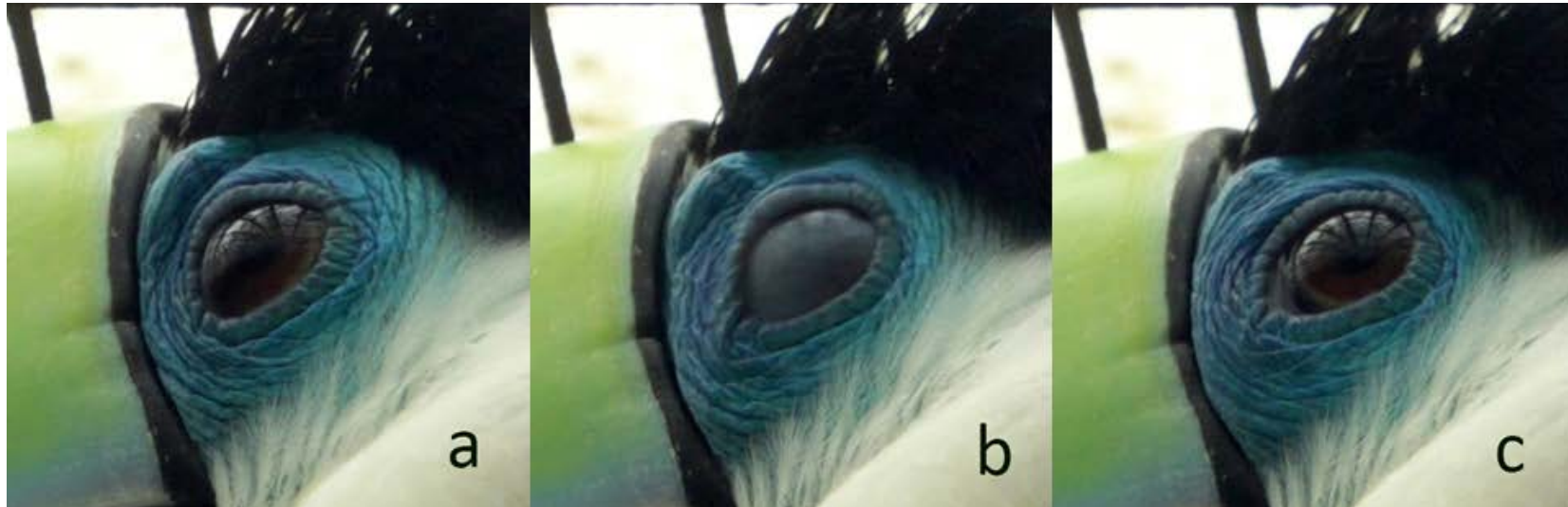


*Downward
movement of
eye with
?slight globe
retraction,
nictitating
membrane
blink and
elevation of
lower lid with
drowsiness.*

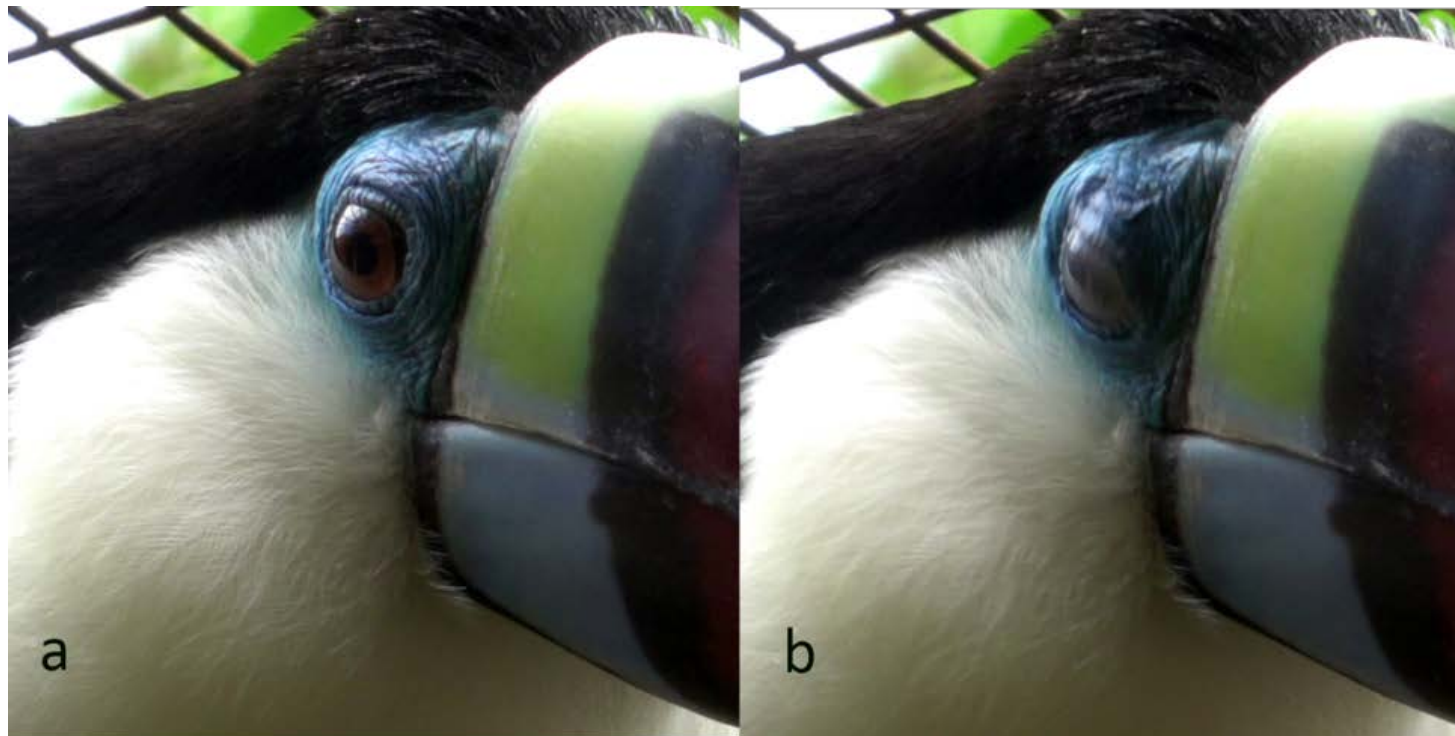
Order Piciformes

Family Ramphastidae

Red-billed toucan (*Ramphastos tucanus*)



a) Pre-blink. b) Nictitating membrane covers cornea. c) Post-blink after eye movement has finished. Every eye movement, however slight, was accompanied by a nictitating membrane blink



a) Pre-blink. b) Nictitating membrane covers cornea. Upper lid is pulled out as eye looks down.

Toco toucan (*Ramphastos toco*)

Nictitating membrane blink on eye movement



Family Lybiidae

Red-and-yellow barbet (*Trachyphonus erythrocephalus*)

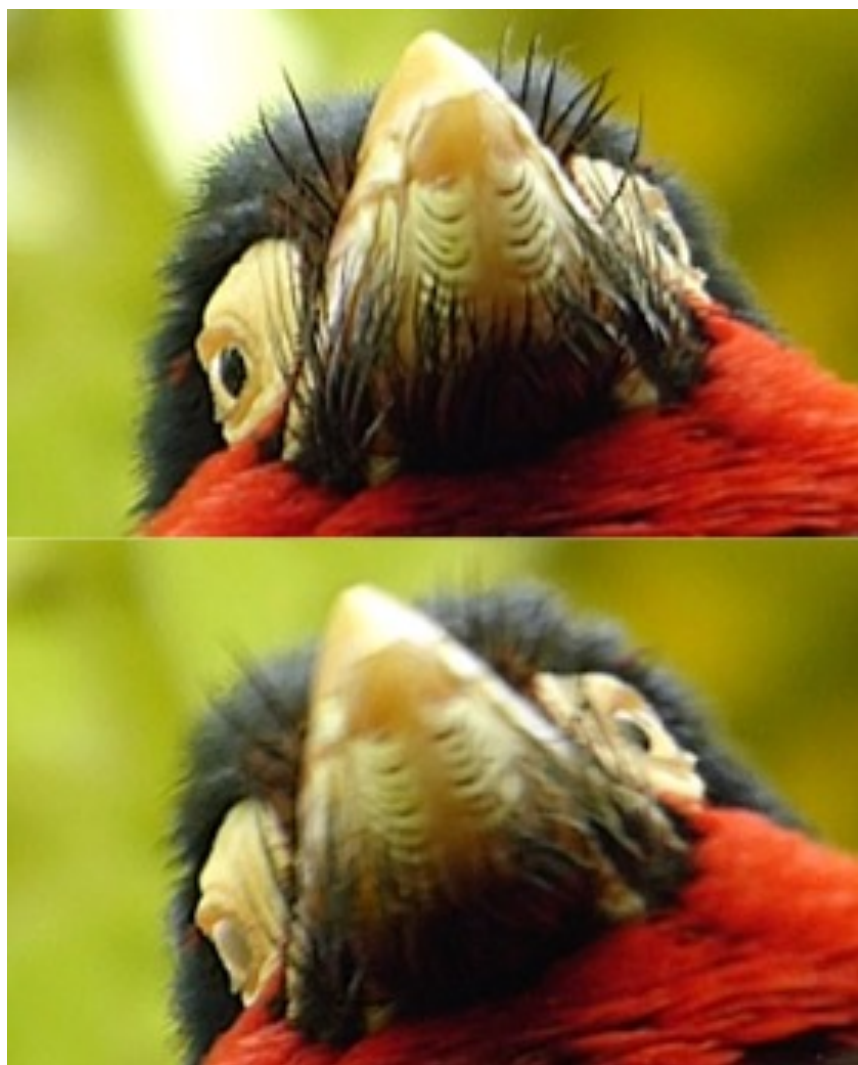
Nictitating membrane blink on head turn



Bearded barbet (*Lybius dubius*)

Nictitating membrane blink on head turn





Eyelids come together during head scratching



Eyelids come together and nictitating membrane crosses with drowsiness



Nictitating membrane blink with slight lowering of inner part of upper lid



Change in pupil size then elevation of lower lid with drowsiness



Family Picidae

European green woodpecker (*Picus viridis*)

Upper lid and nictitating membrane blink on head turn



Order Podicipediformes

Family Podicipedidae

Australasian grebe (*Tachybaptus novaehollandiae*)

Nictitating membrane blink on head turn





Order Podargiformes

Family Podargidae

Tawny frogmouth (*Podargus strigoides*)

Upper lid and nictitating membrane blink on head turn: closing the eye



Upper lid and nictitating membrane blink on head turn



Upper and lower lid blink



Upper lids fall slightly. Right pupil (on the less illuminated side) is larger than the left



Pupillary constriction



Species

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African pied starling, (*Lamprotornis bicolor*), 109
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American flamingo (*Phoenicopterus ruber*), 406
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