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# Eastern Yellow Wagtail *Motacilla tschutschensis* and Western Yellow Wagtail *M. flava* in Sri Lanka with comments on their status in South Asia

by Gary Allport, J. Martin Collinson, Sampath S. Seneviratne & Thomas J. Shannon

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<http://zoobank.org/urn:lsid:zoobank.org:pub:9CD44797-7905-42B6-A5C8-D8297BFE9E26>

**SUMMARY.**—Yellow wagtails *Motacilla* sp. observed in Sri Lanka in November 2019 had the ‘rasping’ voice characteristic of Eastern Yellow Wagtail *M. tschutschensis*. DNA confirmed two individuals as *M. t. tschutschensis* / *plexa*, whilst plumage characters suggested one was *M. t. plexa* and the other *M. t. tschutschensis*, the first records of the species in Sri Lanka. Field observations in Colombo, during November 2019–January 2020 yielded 106 yellow wagtail records. Vocalisations of 57 were recorded; all had ‘rasping’ calls, and none had vocal or plumage features diagnostic of Western Yellow Wagtail *M. flava*. A review of material in Colombo and Tring museums yielded no specimens of Eastern Yellow Wagtail from Sri Lanka, and the species’ status in South Asia is unclear. Seventy-one photographic records of yellow wagtails in Sri Lanka from varied sources revealed seven records of *M. f. lutea* based on plumage characters. The rest could not be assigned to either Eastern Yellow or Western Yellow Wagtails. Eastern Yellow Wagtail is probably a common winter visitor to Sri Lanka and presumably also numerous on passage further north in South Asia. Birds in this region not identified to species using at least voice should be recorded as the species pair. Further research is required to clarify any previous specimen records of Eastern Yellow Wagtail in Sri Lanka, the status of the subspecies, the migratory routes involved, and the status of both species across South Asia.

Eastern Yellow Wagtail *Motacilla tschutschensis* and Western Yellow Wagtail *M. flava* are similar species with a complex taxonomic history. Their breeding ranges encompass almost all of the Palearctic and into north-west North America (Alström *et al.* 2003). There are 15 or more subspecies in the complex and these have been split into as many as 11 species (e.g. Sangster *et al.* 1999), but were usually treated as a single species *M. flava* until Alström & Ödeen (2002), Voelker (2002), Ödeen & Björklund (2003) and Pavlova *et al.* (2003) showed the group to comprise two principal clades, since treated as separate species by the American Ornithologists’ Union (Banks *et al.* 2004). All of the major global taxonomies have followed (Dickinson & Christidis 2014, Clements *et al.* 2019, Gill & Donsker 2020, del Hoyo *et al.* 2019).

Western Yellow Wagtail breeds in the Western Palearctic, central Russia and east to Mongolia (Alström *et al.* 2003, del Hoyo *et al.* 2019) and migrates mostly to Africa (Moreau 1972, Urban *et al.* 1992) but also to the Indian Subcontinent (Rasmussen & Anderton 2012). Eastern Yellow Wagtail breeds in north-east Asia, Alaska and extreme north-west Canada (Alström *et al.* 2003, del Hoyo *et al.* 2019), and migrates through East and South-East Asia to winter from Myanmar south to Australia (Higgins *et al.* 2001).

The taxonomy of Eastern Yellow Wagtail is still under scrutiny. Alström *et al.* (2003) recognised three subspecies in the eastern clade: nominate *tschutschensis* (‘Eastern Yellow’ or ‘Alaskan’ Wagtail, including *alascensis*, *simillima*, *angarensis* and *zaissanensis* as synonyms),

*taivana* ('Green-headed' Yellow Wagtail), and *macronyx* ('Manchurian' Yellow Wagtail). The north-east Siberian taxon *plexa* was placed in *M. flava* and synonymised with *thunbergi* by Alström *et al.* (2003); however, Banks *et al.* (2004) recognised it and placed it under *tschutschensis*, a treatment supported by more recent genetic analysis (Harris *et al.* 2018) which showed *plexa* to be a separate subspecies assigned to *M. tschutschensis* by Gill & Donsker (2020) and del Hoyo *et al.* (2019). Inclusion of *plexa* potentially extends the range of Eastern Yellow Wagtail west as far as Yamal in central Siberia, where Pavlova *et al.* (2003) identified *plexa* near the border of the Western Palearctic based on genetic work. DNA analyses also show a possible further split between the north-eastern (*plexa* and *tschutschensis*) and south-eastern (*macronyx* and *taivana*) forms of Eastern Yellow Wagtail (Pavlova *et al.* 2003, Harris *et al.* 2018; F. Rheindt *in litt.* 2019).

The precise range of Eastern Yellow Wagtail is still to be elucidated, but recent records of vagrants in Western Europe have helped hone the identification criteria. Bot *et al.* (2014) concluded that it is difficult to use plumage alone to separate the two species with certainty, but in combination with flight calls it is possible to identify at least some Eastern Yellow Wagtails in the field, especially with the benefit of sonograms (M. Robb *in litt.* 2019). Hindclaw length is also indicative (see Appendix 1); in addition, mtDNA analysis of feathers or droppings has proffered strong support to field identifications (Collinson *et al.* 2013).

The most recent comprehensive review of the status of South Asia's birds (Rasmussen & Anderton 2012) concluded that five subspecies of Western Yellow Wagtail overwinter in the region (see Appendix 1). However, the occurrence of Eastern Yellow Wagtail was unclear and its status was considered 'hypothetical'.

## Recent sightings in Sri Lanka

On 11 November 2019 GA & J. Allport found what they presumed was a Western Yellow Wagtail on freshly ploughed rice paddies at Kimbulawala (06°52'22.4"N, 79°55'48.5"E) on the outskirts of Colombo. Short snatches of call were heard and suggested that the bird had a rasping tone in flight, similar to Citrine Wagtail *M. citreola* and unlike Western Yellow Wagtail, which are very familiar to GA from Europe and Africa. GA returned next morning with sound-recording equipment (Tascam DR-05 digital recorder and Sennheiser MKE800 microphone) and found 12–15 yellow wagtails in the same area, all with similar rasping calls. Analysis of photographs was inconclusive, but suggested that birds with mid-grey caps and whitish supercilia resembling *thunbergi* and *beema* were present (see Appendix 1 for identification criteria). The images did, however, exclude both *lutea* and *feldegg*, the only forms of Western Yellow Wagtail reported to occur in South Asia and which usually, or can, give rasping calls (Bot *et al.* 2014); both have been noted in Sri Lanka (Warakagoda *et al.* 2012).

Sonograms were prepared using Raven Pro 1.6 (Cornell Lab of Ornithology) visualised under the same slide windows (400) and same temporal and frequency scale as those compiled by Bot *et al.* (2014). All were found to show modulation, 'rasping', in the second element of the calls, matching Eastern Yellow Wagtail (Figs. 1–2); none showed characters of *thunbergi*- or *feldegg*-like calls. The recordings were shared with M. Robb (*in litt.* 2020) who confirmed the identification as Eastern Yellow Wagtail.

GA returned to the site at 06.00 h on 20 November 2019 with W. Duncan, and c.40 birds were seen and heard passing overhead in 15 minutes, all of which gave only rasping calls. A search of adjacent sites that day found 2–3 yellow wagtails that gave similar calls on a nearby lawn. More photographs (Figs. 3–4) and sound-recordings were made (see Xenocanto references for recordings of calls in legends to Figs. 3–4), and droppings collected from these two birds, immediately after they were seen defecating.

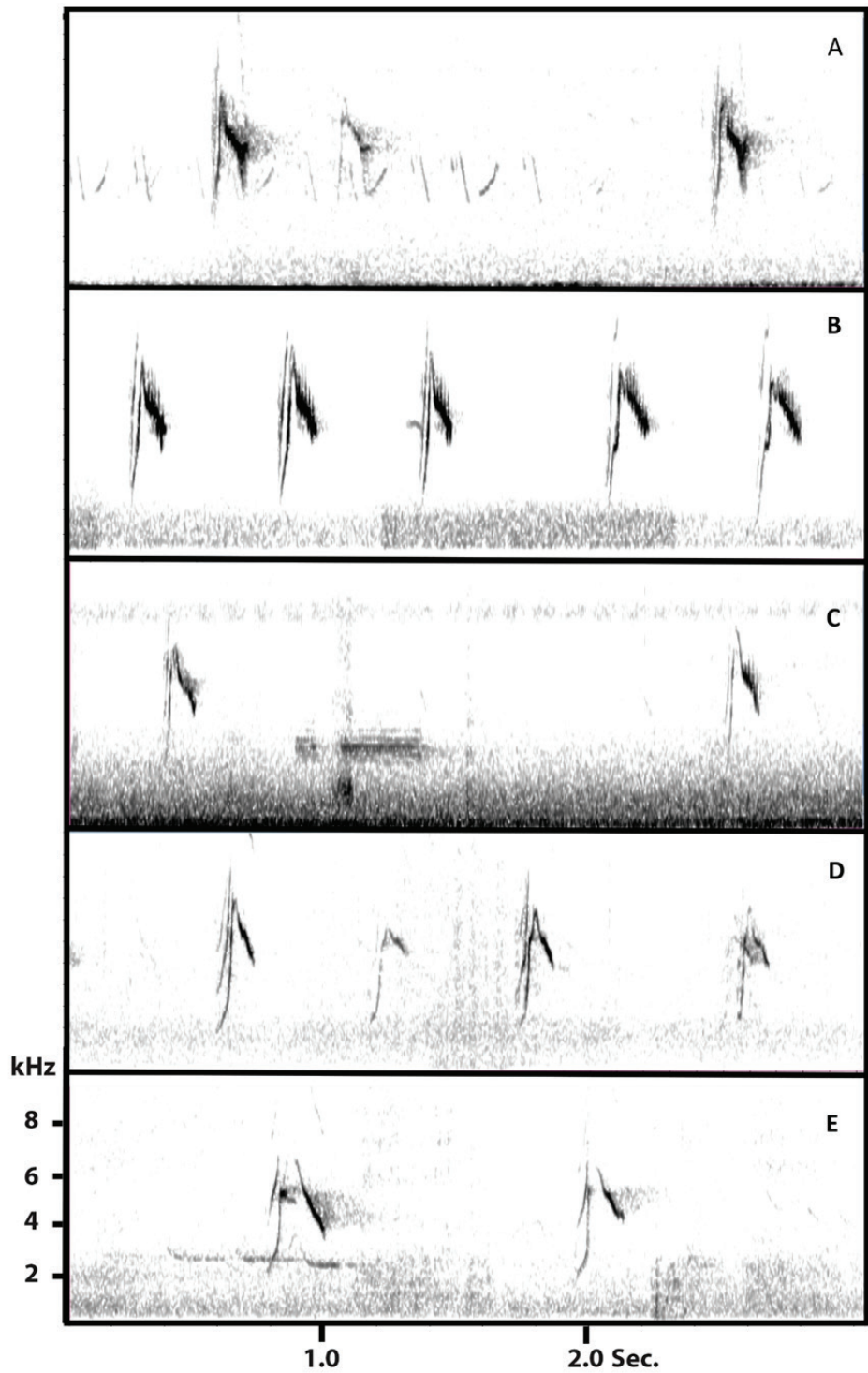


Figure 1. Comparison of flight call of *M. t. tschutschensis*-type Eastern Yellow Wagtail (C; voice at XC 596564; bird in Fig. 3; SL\_Yellow\_1 in Fig. 5) with Eastern Yellow Wagtail *M. t. tschutschensis* (A; XC 113757) and *M. t. plexa* (B; XC 153011), and Western Yellow Wagtail *M. flava beema* (D; XC 145073) and *M. f. thunbergi* (E; XC 602792).

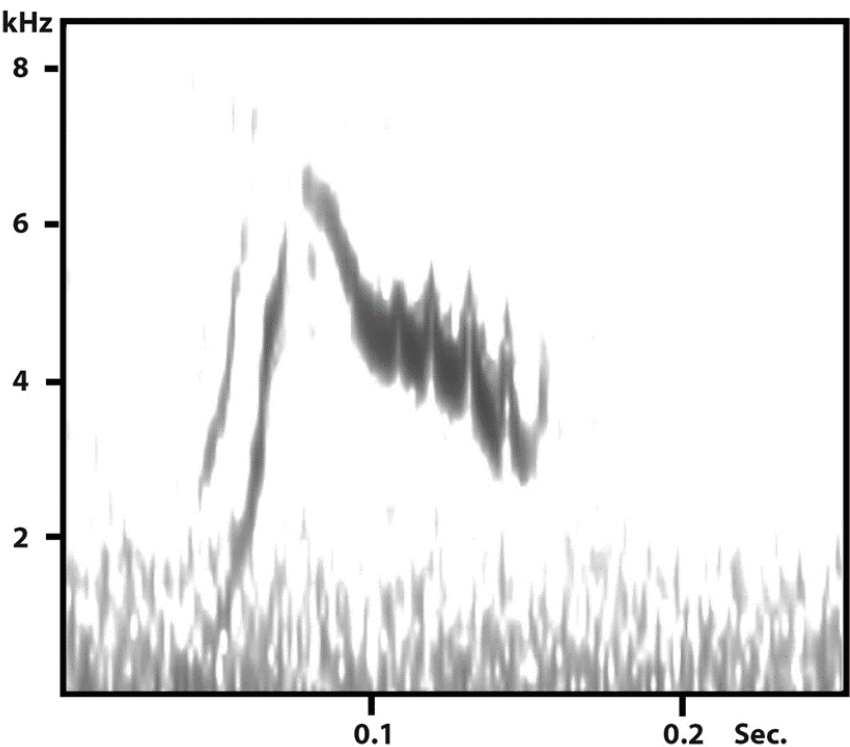


Figure 2. Single flight call of *M. t. tschutschensis*-type Eastern Yellow Wagtail (bird in Fig. 3, C, voice at XC 596564; SL\_Yellow\_1 in Fig. 5) to show modulated ‘rasping’ quality of the second descending element of the call. Temporal and frequency axes differ from Fig. 1. Sonogram visualised in 176 window Raven Pro 1.6.



Figures 3–4. Eastern Yellow Wagtails *Motacilla tschutschensis* in Colombo, Sri Lanka, 20 November 2019. That in Fig. 3 (voice = XC 596564) is an *M. t. tschutschensis*-type showing a whitish supercilium on a concolorous grey head with greenish wash, and Fig. 4 (= XC 596583 and XC 596584) is an *M. t. plexa*-type showing a near-concolorous darker grey head with no pale supercilium but a few pale feathers above the eye (Gary Allport)

## Genetic analysis and identification

DNA was isolated from a fresh dropping from each bird using QIAamp DNA Micro Kit according to the manufacturer's instructions, with the addition of 0.1 M dithiothreitol in the digestion mix and elution into 80 µl Buffer AE. A 231-bp fragment of the mitochondrial control region (CR) was amplified using primers and PCR protocols as described in Ödeen & Björklund (2003). Laboratory-generated PCR products were gel purified and extracted using the QIAquick Gel Extraction Kit following the manufacturer's instructions, with final elution into 30 µl Buffer EB. Extracted PCR products were Sanger sequenced. Sequences from the mitochondrial control region of 17 birds were accessed on GenBank for comparison. These included four subspecies of Eastern Yellow Wagtail, six subspecies of Western Yellow Wagtail, and Grey Wagtail *M. cinerea* as outgroup (after Ödeen & Björklund 2003: see Appendix 2). We used Geneious version 7.1.6 (Kears *et al.* 2012) to examine trace files for quality, to edit sequences and multiple align sequences across taxa using ClustalW algorithm (Larkin *et al.* 2007). We examined appropriate models of evolution and the best way to partition gene regions using PartitionFinder ver. 1.1.0 (Lanfear *et al.* 2012). Phylogenetic trees were constructed through the Maximum Likelihood (ML) approach using RAxML ver. 8.1.22 (Stamatakis 2014). We conducted tree search rapid bootstrap of 10,000 replicates and thereafter a thorough ML search of ten runs using a separate GTR evolutionary model for each partition. Invariant sites were not included in the model. The number of base substitutions per site was conducted using the Maximum Composite Likelihood model (Tamura *et al.* 2004). The analysis involved 18 nucleotide sequences. Codon positions included were 1st+2nd+3rd+noncoding. All positions containing gaps and missing data were eliminated. There was a total of 231 positions in the final dataset. Evolutionary analyses were conducted in MEGA7 (Kumar *et al.* 2016).

The two genotyped birds grouped most closely with sequences of *M. t. tschutschensis* (Fig. 5) and were 100% identical to a bird from the UK (Colyton, Devon, 2010) that was confirmed as *M. t. tschutschensis* on plumage, call and DNA (Collinson *et al.* 2013). *M. t. tschutschensis* and *plexa* share haplotypes at mitochondrial loci and cannot therefore currently be separated on genetic criteria alone (Drovetski *et al.* 2018). Available sequences from *macronyx* and *taivana* in GenBank differed in four base pairs (bp) and all *M. flava* sequences by 6–10 bp (2.6–4.3% divergence). The samples also were clearly divergent from all other *Motacilla* taxa. From this we can unambiguously identify both birds as Eastern Yellow Wagtail of one of the north-eastern subspecies, *tschutschensis* or *plexa* (rather than south-eastern *macronyx* or *taivana*). For subspecific identification based on phenotypic characters see Figs. 3–4 and Appendix 1.

## Further field observations

GA observed another 106 yellow wagtails at sites in the Colombo area in December 2019–January 2020. All birds which vocalised (57) had rasping calls and were considered to be Eastern Yellow Wagtails. Approximately 30 were not heard calling or not seen well enough to be assigned to species, but none showed any features diagnostic of Western Yellow Wagtail. Of 78 birds seen well in the field, eight had plumage characters of *M. t. tschutschensis* (adults with clear white complete supercilia in front of and behind the eye; see Appendix 1) and 22 showed characters of *plexa* / *macronyx*. The rest (48) were in non-adult plumages with head patterns that did not permit subspecific identification.

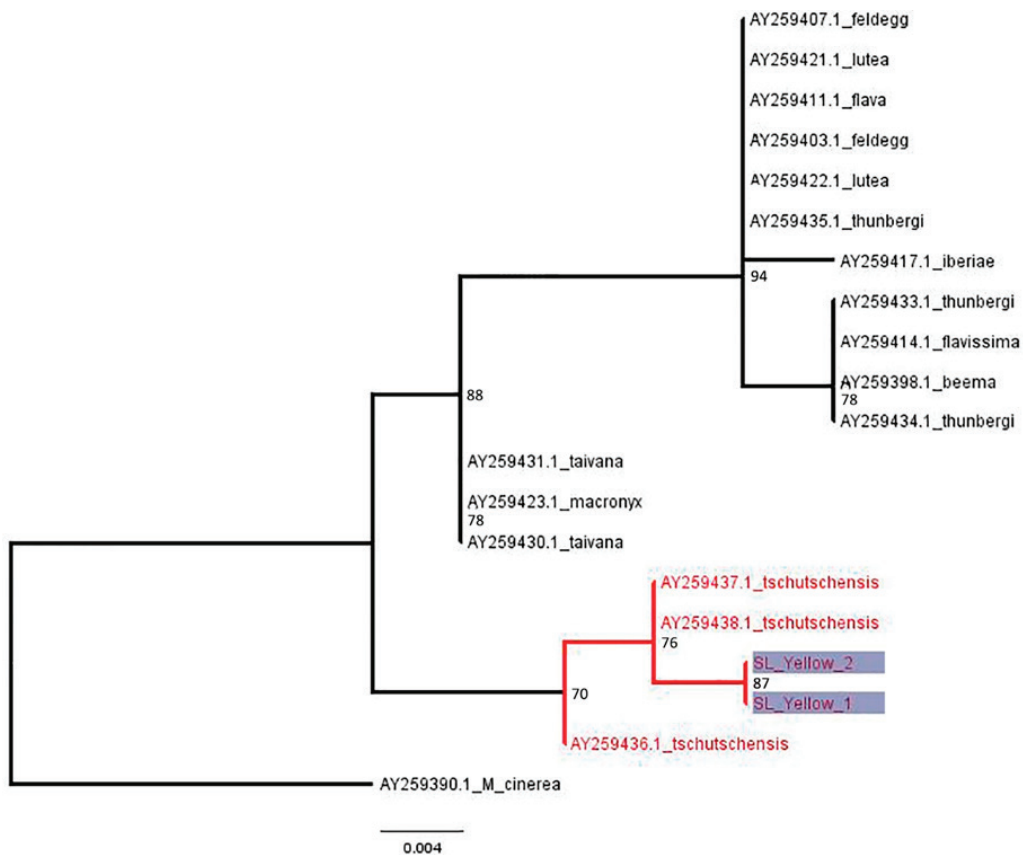


Figure 5. Phylogenetic affinities of the two yellow wagtails from Sri Lanka (samples SL\_Yellow\_1 and 2) with ten other subspecies representing Eastern Yellow Wagtail *Motacilla tschutschensis* and Western Yellow Wagtail *M. flava*. Analysis based on Maximum Likelihood (ML) of the mitochondrial control region. Taxa labels include subspecies name and GenBank accession numbers (see Appendix 2). Nodal support of  $\geq 70$  of bootstrap values indicated. A separate coalescent-based Bayesian analysis using \*BEAST (Heled & Drummond 2010) for the same region yielded a phylogeny with the same topography (tree not shown). Sri Lankan birds cluster with *M. t. tschutschensis* but no comparative control region DNA data were available for *M. t. plexa* (which was therefore not excluded).

### Status of Eastern Yellow Wagtail in Sri Lanka and South Asia

Due to finding significant numbers of Eastern Yellow Wagtail in Sri Lanka and no Western Yellow Wagtails, a review of the national and regional status of Eastern Yellow Wagtail was undertaken. All key literature was checked, two museum collections were visited by GA, and records with documentation on citizen science platforms (Xeno-canto, Oriental Bird Club image database, eBird) and on social media (Field Ornithology Group of Sri Lanka and Birds Thaprobatica Facebook pages) were used to establish the status of the two species.

**Literature review.**—Several races of Western Yellow Wagtail winter in South Asia but the status of Eastern Yellow Wagtail is unclear. However, most of the subspecies have been consistently recognised in the past—except *plexa*—and their statuses discussed in the major regional ornithological texts, albeit under different arrangements (Ali & Ripley 1998, Grimmett *et al.* 1998, 2011, Kazmierczak 2000, Rasmussen & Anderton 2012).

Regarding the races of Eastern Yellow Wagtail, Ali & Ripley (1998) considered *M. f. simillima* (a synonym of *M. t. tschutschensis*) to be a common winter visitor to Kerala (Ali 1985), Sri Lanka (Phillips 1958; see below) and the Andamans (Vaurie 1959), with passage records in northern India. This status is probably correct but unsubstantiated. Alström *et al.* (2003) mapped the winter range of *M. t. tschutschensis* as far west as the Andamans (citing Ali & Ripley 1998) but not elsewhere in South Asia, and showed all yellow wagtails as absent from Sri Lanka.

Rasmussen & Anderton (2012) considered Eastern Yellow Wagtail hypothetical in the region, mentioning uncorroborated reports of '*simillima*' on the Andamans, '*zaissanensis*' mainly in India and *plexa* probably there. Alström *et al.* (2003) treated *plexa* as a synonym of *thunbergi* but noted that the population probably winters in India, and Grimmett *et al.* (1998, 2011) treated *plexa* as a race of Western Yellow Wagtail but did not specify a winter range.

Rasmussen & Anderton (2012) treated *taivana* as a subspecies of Western Yellow Wagtail, but did not accept two records from West Bengal and Bhutan (source presumably Ali & Ripley 1998), stating that the specimen from Bhutan was a misidentified Citrine Wagtail, and that from Haora, West Bengal (Walton 1903) had been re-identified as *M. f. lutea*. Alström *et al.* (2003) also reported single records of *taivana* in Nepal (Inskipp & Inskipp 1991; but not detailed by the same authors in Grimmett *et al.* 1998, 2011, 2016, and no further details are available; T. Inskipp *in litt.* 2020) and Pakistan (Khanum & Ahmed 1988; without substantiation). Neither record is cited elsewhere.

There are also more recent published sightings of putative Eastern Yellow Wagtail from India by Viswanathan *et al.* (2017) who described two individuals of nominate *tschutschensis* (in Assam in 2006 and Andamans in 2016) and one *taivana* (Andamans in 2016). They did not conclude that these were verified reports *per se* (it is worth noting that no details of the calls of these birds were included and it is difficult to be certain of the identity of the two records of *M. t. tschutschensis* based on the published photographs). However, both these races of Eastern Yellow Wagtail were added to the Indian checklist (Praveen *et al.* 2021) on this basis (editorial note in Viswanathan *et al.* 2017). There is another potential record in India from Gujarat (Varu 2016) with recent sightings in Bangladesh by Lees *et al.* (2011) of 'a large flock of 350 "Eastern" Yellow Wagtails' at Char Fakura (but no indication as to how these were identified) and 35–40 yellow wagtails in a range of plumages giving rasping calls at Nijhum Dwip National Park, Chittagong Bibhag, in December 2019 (<https://ebird.org/india/checklist/S62580500>; P. Thompson *in litt.* 2020).

In Sri Lanka, Phillips (1958, 1978) reported small numbers of *beema* or putative *simillima* amongst abundant *M. flava thunbergi* in 1955 and 1956 at Bundala, near Habantota. Two specimens were collected but identification was inconclusive, and their current whereabouts are unknown (see below). Eastern Yellow Wagtail is not included on the Sri Lanka National Bird List (Ceylon Bird Club 2011) or by Warakagoda *et al.* (2012), but Kotagama & Ratnavira (2017) described *simillima* as a rare migrant, without citing sources.

In summary, the status of Eastern Yellow Wagtail in South Asia is unclear; a thorough review of records in light of new taxonomic arrangements and advanced identification techniques is desirable. Overall, it appears that the nominate race could occur in the Andamans, Kerala and Sri Lanka, and possibly more widely. Both *macronyx* and *plexa* could occur in the north but identification using plumage characters alone precludes specific diagnosis. Some records of *M. t. tschutschensis* and *taivana* in the Andamans, India, and of *M. tschutschensis* in Bangladesh seem likely to be correct. However, all these records are unconfirmed.

**Specimen records from Sri Lanka.** National Museum of Natural History, Colombo (CNMS).—A total of 18 specimens labelled *M. f. thunbergi* collected in Sri Lanka are held

at CNMS (see Appendix 3), 11 of which were examined by GA on 7 January 2020. It was impossible to confidently assign any of the specimens to taxon based on plumage, but hindclaw measurements showed two birds >12.9 mm (13.4 mm, specimen number 103B; 14.2 mm, 103N—both within the range of Eastern Yellow Wagtail), one bird <9.5 mm (8.7 mm, 103H—within the range of Western Yellow Wagtail) and eight birds >9.5 but <12.9 mm (not assignable to either species using this character). Hindclaw length is thought to be useful in identification (Red'kin & Babenko 1999) but Alstrom *et al.* (2003) reported very extensive overlap and expressed caution in relying on this character. Therefore the identifications based on this character alone are considered tentative. Unfortunately, none of the four specimens donated to the museum by 'Mrs Phillip' (presumably collected by W. Phillips; see Appendix 3) could be located due to refurbishment work, although museum records suggest that none matches the details of two possible *simillima* collected by him in 1955 (Phillips 1958, 1978). Destructive sampling is not currently permitted by CNMS so DNA analysis was not possible.

*Natural History Museum, Tring (NHMUK).*—The specimens of all forms of yellow wagtail were reviewed with a focus upon Sri Lanka, but no detailed study of Western Yellow Wagtails was undertaken due to time constraints. There are no specimens from Sri Lanka in NHMUK of *tschutschensis*, *plexa*, *macronyx* or *taivana*, but two originally labelled *M. f. thunbergi* collected in Sri Lanka have been placed with the *M. f. simillima* (= *M. t. tschutschensis*). These were collected on open marshy ground on the coast 'nr Vakari, Eastern Province' (presumably Vakari Lagoon near Batticaloa) by 'Coll. W. W. A. Phillips, Ceylon' in February 1947, 'when many wagtails were seen' (notes on specimen label). For other details, see Fig. 6. Both are labelled as males (presumably sexed by dissection) and have a *tschutschensis*-type head pattern with concolorous mid-grey crown and ear-coverts with dark greenish feather tips and thin clean white supercilia reaching just short of the upper ear-coverts from the lores (Fig. 6). Hindclaw lengths were measured by GA as 11 mm and 13 mm, the latter theoretically diagnostic for *tschutschensis* (see Appendix 1) but only by 0.1 mm. It is, however, unwise to confirm the identity of these birds as in both



Figure 6. Head patterns of two museum specimens of yellow wagtail *M. flava* / *tschutschensis*: NHMUK 1947.46.61 (left) and 1947.46.60 (right), both labelled *M. flava thunbergi* but stored with the *M. f. simillima*, collected by W. A. Phillips in Sri Lanka in February 1947 (Gary Allport, © Natural History Museum, London)

there are a few pale feathers in the ear-coverts below the eye suggesting that *beema* cannot be excluded (Fig. 6). DNA analysis could ascertain the identity of these two specimens, potentially the first records of Eastern Yellow Wagtail in Sri Lanka. They resemble those also described as collected by Phillips later in 1955 (Phillips 1958, 1978; see above) which were ‘most probably of the race *beema*’ but were collected on different dates and at other localities. These two NHMUK specimens appear not to have been mentioned by Phillips in any of his accounts.

*Bombay Natural History Society (BNHS).*—Not visited, but two specimens labelled ‘*M. f. simillima*’ (= *M. t. tschutschensis*) from Edanad, Kerala, India, are listed in the museum inventory (Unnithan 1995). However, T. Inskipp (*in litt.* 2020) found that both specimens have yellow supercilia, so are not *simillima* but may be *taivana*.

*Citizen science and other records from Sri Lanka.*—Five citizen science and social media platforms were searched for yellow wagtail records and images identified to species, subspecies or subspecies-group using the characters outlined in Appendix 1. Webpages for sources and the results are given in Table 1.

No sound-recordings from Sri Lanka were found on Xeno-canto (<https://www.xeno-canto.org/species/Motacilla-tschutschensis>, <https://www.xeno-canto.org/species/Motacilla-flava>, both accessed 20 January 2020). Nine photographs of Eastern / Western Yellow Wagtails are available on Oriental Bird Images (<http://orientalbirdimages.org/> but this database is currently moving to the Macaulay Library, Cornell Lab of Ornithology) from Sri Lanka; none was identifiable to species, but six could be narrowed down to certain similar subspecies belonging to the different species (see Table 1).

No Sri Lankan records of Eastern Yellow Wagtail were found on eBird (<https://ebird.org/>) but 478 records were categorised as Western Yellow Wagtail. Neither field notes nor sound-recordings for these records were provided. Twenty-six were supported by photographs, of which two were identified as Western Yellow Wagtail, both *M. f. lutea* (<https://ebird.org/checklist/S22154905>, <https://ebird.org/checklist/S26811414>). There is also one bird with a white supercilium that is likely to be *M. t. tschutschensis*, but without a sound-recording it is impossible to be certain (<https://ebird.org/checklist/S45095682>).

Two Facebook pages used frequently by Sri Lankan birders were consulted. The Field Ornithology Group of Sri Lanka (FOGSL) is a bird conservation NGO (the BirdLife International partner in Sri Lanka) with 10,759 members of its public Facebook group (on

TABLE 1  
Yellow wagtail (*M. flava* or *M. tschutschensis*) records from Sri Lanka on four citizen science and social media platforms (accessed 20 January 2020) identified from photographs and allocated to species or to certain similar subspecies belonging to the different species (see Appendix 1 for criteria). Sources: Oriental Bird Images (<http://orientalbirdimages.org/>, which database is moving to the Macaulay Library, Cornell Lab of Ornithology), eBird (<https://ebird.org/>), FOGSL (<https://www.facebook.com/groups/fogsl/>) and Birds Thaprobatica (<https://www.facebook.com/groups/635177786496537/>).

| Yellow wagtail taxa                              | Oriental Bird Images | eBird | FOGSL | Birds Thaprobatica | Total | %    |
|--|----------------------|-------|-------|--------------------|-------|------|
| <i>M. f. thunbergi</i> / <i>M. t. plexa</i>      | 2                    | 8     | 4     | 4                  | 18    | 25.4 |
| <i>M. f. beema</i> / <i>M. t. tschutschensis</i> | 3                    | 9     | 4     | 9                  | 25    | 35.2 |
| <i>M. f. lutea</i> / <i>M. t. taivana</i>        | 1                    | 0     | 0     | 0                  | 1     | 1.4  |
| Not assignable                                   | 3                    | 7     | 6     | 4                  | 20    | 28.2 |
| <i>M. f. lutea</i>                               | 0                    | 2     | 1     | 4                  | 7     | 9.9  |
| Total  | 9                    | 26    | 15    | 21                 | 71    | 100  |

20 January 2020) attracting 3–5 postings per day. There are 15 postings involving yellow wagtails (records 17 March 2018–20 January 2020), one of which is assignable to *lutea*. Birds Thaprobatica is a private Facebook group with 6,551 members (on 20 January 2020); this held 21 relevant posts (records 4 January 2017–20 January 2020), including four assignable to *lutea*.

There was no diagnosable Eastern Yellow Wagtail documented on social media but 61% of records (43 of 71) were assigned to *thunbergi* / *plexa* or *beema* / *tschutschensis*. The seven confirmed records of Western Yellow Wagtail (9.9% of the records) were all *M. f. lutea*.

## Discussion

DNA evidence establishes that Eastern Yellow Wagtail occurs in Sri Lanka and field records based on voice suggest it is probably a common winter visitor. It seems likely that Eastern Yellow Wagtails reach Sri Lanka via the migration corridor following the east coast of India (Kotagama & Ratnavira 2017, Balachandran *et al.* 2018). This implies that the species could be a regular and possibly common passage migrant further north in South Asia, and confirmation of recent sightings of possible Eastern Yellow Wagtails in Bangladesh (Viswanathan 2019) would support this conclusion. However, it is also possible that some, even all, Eastern Yellow Wagtails enter Sri Lanka via the 'Andaman Islands route' crossing the Bay of Bengal from Myanmar (Kotagama & Ratnavira 2017) without first entering the subcontinent. There are likely records from the Andamans (Viswanathan *et al.* 2017) and many sightings of yellow wagtails on the east coast of Sri Lanka; e.g. Phillips (1958) noted wagtails as numerous on the east coast in February, which notionally supports this hypothesis. However, Robson (2009) noted that yellow wagtails are absent from western Myanmar, offering no evidence to support a major migration route across the Bay of Bengal. Perhaps numbers reaching Sri Lanka are too small that they evade detection in under-visited west Myanmar.

A more detailed study has been initiated into the morphological, plumage, vocal and genetic traits of yellow wagtails trapped via the National Bird Ringing Programme of Sri Lanka. Captured wagtails are being measured, photographed and aged following Pyle (1997) and Jenni & Winkler (2020). Particular attention is paid to moult and wear scores. A tiny amount of blood is also collected for multi-loci genetic analysis at the Laboratory for Molecular Ecology and Evolution, Univ. of Colombo. The genetic data will shed further light on subspecific status. All birds are ringed in an effort to learn more concerning movements within Sri Lanka and their moult during the winter period. On release, those wagtails that utter a flight call are recorded. This study will answer some of the key issues raised herein. Further analysis of sight records in citizen science databases such as eBird will help to clarify seasonal patterns both in Sri Lanka and more widely in South Asia, and their migration routes may become more evident.

The status of Western Yellow Wagtail in Sri Lanka was not covered in detail, but *M. f. lutea* clearly occurs in at least small numbers. The status of *M. f. thunbergi*, *feldegg* and *beema* previously thought to occur in Sri Lanka (Phillips 1978, Warakagoda *et al.* 2012, Kotagama & Ratnavira 2017) also warrants re-examination, including more widely in South Asia.

Birdwatchers in South Asia should be alert to the possibility of Eastern Yellow Wagtail throughout the region, and of the importance of vocalisations in the field identification of yellow wagtails. Birds not assignable to species should be recorded separately in data entry, for example as the species-pair in eBird.

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### References

- Ali, S. 1985. *Birds of Kerala*. Second edn. Oxford Univ. Press, Bombay.
- Ali, S. & Ripley, S. D. 1998. *Handbook of the birds of India and Pakistan together with those of Bangladesh, Nepal, Bhutan and Sri Lanka*, vol. 9. Second edn. Oxford Univ. Press, Bombay.
- Alström, P. & Ödeen, A. 2002. Incongruence between mitochondrial DNA, nuclear DNA and non-molecular data in the avian genus *Motacilla*: implications for estimates of species phylogenies. Pp. 1–18 in Alström, P. Species limits and systematics in some passerine birds. Ph.D. thesis. Uppsala Univ.
- Alström, P., Mild, K. & Zetterström, D. 2003. *Pipits & wagtails of Europe, Asia and North America*. Christopher Helm, London.
- Balachandran, S., Katti, T. & Manakadan, R. 2018. *Indian bird migration atlas*. Oxford Univ. Press, Bombay.
- Banks, R. C., Cicero, C., Dunn, J. L., Kratter, A. W., Rasmussen, P. C., Remsen, J. V., Rising, J. D. & Stotz, D. F. 2004. Forty-fifth supplement to the American Ornithologists' Union *Checklist of North American birds*. *Auk* 121: 985–995.
- Bot, S., Groenendijk, D. & van Oosten, H. H. 2014. Eastern yellow wagtails in Europe: identification and vocalisations. *Dutch Birding* 36: 295–311.
- Ceylon Bird Club. 2011. Sri Lanka list (country list) of bird species. <http://www.ceylonbirdclub.org> (accessed 23 March 2020).
- Clements, J. F., Schulenberg, T. S., Iliff, M. J., Billerman, S. M., Fredericks, T. A., Sullivan, B. L. & Wood, C. L. 2019. The eBird/Clements checklist of birds of the world: v2019 (accessed 12 December 2019).
- Collinson, J. M., Smith, A., Waite, S. & McGowan, R. Y. 2013. British records of 'Eastern Yellow Wagtail'. *Brit. Birds* 106: 36–41.
- Dickinson, E. C. & Christidis, L. (eds.) 2014. *The Howard and Moore complete checklist of the birds of the world*, vol. 2. Fourth edn. Aves Press, Eastbourne.
- Drovetski, S. V., Reeves, A. B., Red'kin, Y. A., Fadeev, I. V., Koblik, E. A., Sotnikov, V. N. & Voelker, G. 2018. Multi-locus reassessment of a striking discord between mtDNA gene trees and taxonomy across two congeneric species complexes. *Mol. Phyl. & Evol.* 120: 43–52.
- Esteban, M. R. 2020. Separation of 'Grey-headed' and 'Black-headed Wagtail': a dark-headed *thunbergi* in eastern Spain. *Brit. Birds* 113: 296–298.
- Gill, F. & Donsker, D. (eds.) 2020. IOC world bird list (v10.1) [http://www.worldbirdnames.org/IOC\\_10.1\\_vs\\_other\\_lists.xlsx](http://www.worldbirdnames.org/IOC_10.1_vs_other_lists.xlsx) (accessed 23 March 2020).
- Grimmett, R., Inskipp, C. & Inskipp, T. 1998. *Birds of the Indian Subcontinent*. Christopher Helm, London.
- Grimmett, R., Inskipp, C. & Inskipp, T. 2011. *Birds of the Indian Subcontinent*. Second edn. Christopher Helm, London.
- Grimmett, R., Inskipp, C., Inskipp, T. & Baral, H. S. 2016. *Birds of Nepal*. Second edn. Christopher Helm, London.
- Harris, R. B., Alström, P., Ödeen, A. & Leaché, A. D. 2018. Discordance between genomic divergence and phenotypic variation in a rapidly evolving avian genus (*Motacilla*). *Mol. Phyl. & Evol.* 120: 183–195.
- Heled, J. & Drummond, A. J. 2010. Bayesian inference of species trees from multilocus data. *Mol. Biol. Evol.* 27: 570–580.
- Higgins, P., Peter, J. M. & Steele, W. K. (eds.) 2001. *Handbook of Australian, New Zealand and Antarctic birds*, vol. 5. Oxford Univ. Press, Melbourne.
- del Hoyo, J., Collar, N. & Christie, D. A. 2019. Eastern Yellow Wagtail (*Motacilla tschutschensis*). In del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Lynx Edicions, Barcelona. <https://doi.org/10.2173/bow.eaywag.01> (accessed 12 December 2019).
- Inskipp, C. & Inskipp, T. 1991. *A guide to the birds of Nepal*. Second edn. Christopher Helm, London.
- Jenni, L. & Winkler, R. 2020. *Moult and ageing of European passerines*. Second edn. Bloomsbury, London.
- Kazmierczak, K. 2000. *A field guide to the birds of India, Sri Lanka, Pakistan, Nepal, Bhutan, Bangladesh and the Maldives*. Pica Press, Robertsbridge.

- Kearse, M., Moir, R., Wilson, A., Stones-Havas, S., Cheung, M., Sturrock, S., Buxton, S., Cooper, A., Markowitz, S., Duran, C., Thierer, T., Ashton, B., Meintjes, P. & Drummond, A. 2012. Geneious Basic: an integrated and extendable desktop software platform for the organization and analysis of sequence data. *Bioinformatics* 28: 1647–1649.
- Khanum, Z. & Ahmed, M. 1988. New records of two subspecies of wagtails (Motacillidae: Aves) in Karachi, Pakistan. *Pakistan J. Zool.* 20: 303.
- Kotagama, S. & Ratnavira, G. 2017. *Birds of Sri Lanka; an illustrated guide*. Field Ornithology Group of Sri Lanka, Univ. of Colombo.
- Kumar, S., Stecher, G. & Tamura, K. 2016. MEGA7: Molecular Evolutionary Genetics Analysis version 7.0 for bigger datasets. *Mol. Biol. & Evol.* 33: 1870–1874.
- LANfear, R., Calcott, B., Ho, S. Y. & Guindon, S. 2012. PartitionFinder: combined selection of partitioning schemes and substitution models for phylogenetic analyses. *Mol. Biol. & Evol.* 29: 1695–1701.
- Larkin, M. A., Blackshields, G., Brown, N. P., Chenna, R., McGettigan, P. A., McWilliam, H., Valentin, F., Wallace, I. M., Wilm, A., Lopez, R., Thompson, J. D., Gibson, T. J. & Higgins, D. G. 2007. Clustal W and Clustal X version 2.0. *Bioinformatics* 23: 2947–2948.
- Lees, A. C., Bird, J. P., Chowdhury, S. U. & Martin, R. W. 2011. Status of Red-throated Pipit *Anthus cervinus* in Bangladesh. *Forktail* 27: 104–105.
- Moreau, R. E. 1972. *The Palaearctic-African bird migration systems*. Academic Press, London.
- Ödeen, A. & Björklund, M. 2003. Dynamics in the evolution of sexual traits: losses and gains, radiation and convergence in yellow wagtails (*Motacilla flava*). *Mol. Ecol.* 12: 2113–2130.
- Pavlova, A., Zink, R. M., Drovetski, S. V., Red'kin, Y. & Rohwer, S. 2003. Phylogeographic patterns in *Motacilla flava* and *Motacilla citreola*: species limits and population history. *Auk* 120: 744–758.
- Pyle, P. 1997. *Identification guide to North American birds*, pt. 1. Slate Creek Press, Bolinas, CA.
- Phillips, W. W. A. 1958. 1956 supplement to the (1952) revised checklist of the birds of Ceylon. *Spolia Zeylanica* 28: 183–192.
- Phillips, W. W. A. 1978. *Annotated checklist of the birds of Ceylon (Sri Lanka)*. Revised edn. Wildlife & Nature Protection Society of Ceylon/Ceylon Bird Club, Colombo.
- Praveen J., Jayapal, R. & Pittie, A. 2021. Checklist of the birds of India (v5.0). <http://www.indianbirds.in/india/> (23 May 2021).
- Rasmussen, P. C. & Anderton, J. C. 2012. *Birds of South Asia: the Ripley field guide*. Second edn. Smithsonian Institution, Washington DC & Lynx Edicions, Barcelona.
- Red'kin, Y. A. & Babenko, V. G. 1999. Data on distribution and systematics of yellow wagtail forms (subgenus *Budytes*) in Russian Far East (Amur region). *Russ. Orn. J.* 85: 3–28.
- Robson, C. 2009. *A field guide to the birds of South-East Asia*. Second edn. New Holland, London.
- Sangster, G., Hazevoet, C. J., van den Berg, A. B., Roselaar, C. S. & Sluys, R. 1999. Dutch avifaunal list: species concepts, taxonomic instability, and taxonomic changes in 1977–1998. *Ardea* 87: 139–165.
- Shirihai, H. & Svensson, L. 2018. *Handbook of Western Palearctic birds*, vol. 1. Bloomsbury, London.
- Stamatakis, A. 2014. RAXML version 8: a tool for phylogenetic analysis and post-analysis of large phylogenies. *Bioinformatics* 30: 1312–1313.
- Unnithan, S. 1995. A catalogue of the birds in the collection of Bombay Natural History Society-36: Motacillidae. *J. Bombay Nat. Hist. Soc.* 92: 350–359.
- Urban, E. K., Fry, C. H. & Keith, S. (eds.) 1992. *The birds of Africa*, vol. 4. Academic Press, London.
- Varu, S. 2016. Probable Eastern Yellow Wagtail in Kachchh. *Flamingo* 14: 21.
- Vaurie, C. 1959. *The birds of the Palearctic fauna*, vol. 1. H. F. & G. Witherby, London.
- Viswanathan, A., Sridharan, B., Prince, M., Kokane, P. & Kokane, A. 2017. Records of Eastern Yellow Wagtail *Motacilla tschutschensis tschutschensis* and *M. t. taivana* from India. *Indian Birds* 13: 150–153.
- Voelker, G. 2002. Systematics and historical biogeography of wagtails: dispersal versus vicariance revisited. *Condor* 104: 725–739.
- Walton, H. J. 1903. Notes on the occurrence of *Motacilla taivana* (Swinhoe) near Calcutta. *J. Asiatic Soc. Bengal* 72: 9–10.
- Warakagoda, D., Inskipp, C., Inskipp, T. & Grimmett, R. 2012. *Birds of Sri Lanka*. Christopher Helm, London.
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**Appendix 1.** Status and identification of subspecies of Western Yellow Wagtail *Motacilla flava* recorded in South Asia (Alström *et al.* 2003, Rasmussen & Anderton 2012) and all subspecies of Eastern Yellow Wagtail *M. tschutschensis*. Status in South Asia and descriptive details summarised from Alström *et al.* (2003), Rasmussen & Anderton (2012), Bot *et al.* (2014) and Grimmer *et al.* (2016).

| Subspecies (wintering status)   | Identification: male breeding plumage head pattern  | Call   | Hindclaw length (mm)                      |
|---|---|--|---|
| <i>M. flava</i>   |   |  | Diagnostic; <9.5 mm                       |
| <i>thunbergi</i><br>(widespread south to Sri Lanka and east to Andamans)                        | Not safely distinguishable from <i>M. t. macronyx</i> / <i>plexa</i> . Crown and nape dark blue-grey with diffusely darker lores, and variable short, narrow whitish supercilium mostly behind eye. Regularly shows necklace of dark spots. No white eye-ring.  | Call in flight, on ground / perch a loud, ‘clean’, clear <i>pseeu</i> , <i>psie</i> or <i>psie</i> ; often faintly disyllabic, occasionally clearly so.  | Range 8.2–11.5 (mean 9.5, <i>n</i> = 55)  |
| <i>beema</i><br>(widespread but mainly in north)  | Can be difficult to separate with certainty from <i>M. t. tschutschensis</i> . Crown, nape and ear-coverts similar bluish grey with white subocular crescent (lower ear-coverts can appear almost all white), white supercilium, yellow throat with white border. Broken white eye-ring below eye.  | Call in flight, on ground / perch a loud, ‘clean’, clear, <i>pseeu</i> , <i>psie</i> or <i>psie</i> ; often faintly disyllabic but occasionally clearly so (see <i>feldegg</i> ).  | Range 7.9–12.9 (mean 9.6, <i>n</i> = 33)  |
| <i>feldegg</i><br>(commonly winters in north-west)  | Diagnostic; glossy jet-black head contrasting strongly with green mantle; but some <i>thunbergi</i> can be very dark (see Esteban 2020).  | Harsher calls with marked <i>r</i> sound, deeply rasping; <i>tsreep</i> , <i>tchreep</i> , <i>shreep</i> , <i>srreet</i> , <i>psreeh</i> . Similar calls given infrequently by <i>beema</i> and <i>lutea</i> .                       | Range 7.6–11.3 (mean 9.5, <i>n</i> = 23)  |
| <i>lutea</i><br>(poorly known but records south to Sri Lanka)                                   | Diagnostic; head and throat bright yellow.  | Reported to use both <i>feldegg</i> - and <i>thunbergi</i> -like calls, but little known.  | Range 7.0–12.0 (mean 9.8, <i>n</i> = 14)  |
| <i>leucocephala</i><br>(uncommon in north-west and Nepal)                                       | Diagnostic; all-whitish head with variable grey wash on ear-coverts, sides of rear crown and nape.  | No information   | No data                                   |
| <i>M. tschutschensis</i>  |   |  | Diagnostic; >12.9 mm                      |
| <i>tschutschensis</i><br>(all taxa hypothetical in region, but see text for recent information) | Difficult to separate from any <i>beema</i> with poorly marked subocular crescent. Forehead, crown and nape slightly paler than <i>thunbergi</i> / <i>plexa</i> / <i>macronyx</i> , long whitish supercilium, ear-coverts vary from pale grey (concolorous with crown; less common) to contrastingly darker (diagnostic vs. <i>beema</i> but note potential confusion with <i>feldegg</i> $\geq$ <i>flava</i> intergrades, mainly var. ‘ <i>dombrowskii</i> ’; unlikely in South Asia but possible) to almost pure black. Ear-coverts usually uniform with no white subocular markings. Broken white eye-ring. Throat yellow with white border. | <i>M. t. tschutschensis</i> , <i>plexa</i> and <i>macronyx</i> : sharper and more explosive than <i>feldegg</i> -type, rasping or buzzing <i>tsreep</i> , <i>tchreep</i> or <i>peerrt</i> . Very similar to call of Citrine Wagtail. | Range 9.9–13.8 (mean 11.1, <i>n</i> = 19) |

| Subspecies<br>(wintering status) | Identification: male breeding<br>plumage head pattern   | Call   | Hindclaw<br>length (mm)                         |
|----------------------------------|---|--|---|
| <i>plexa</i>                     | Not safely distinguishable from<br><i>thunbergi</i> / <i>macronyx</i> .   |  |   |
| <i>macronyx</i>                  | Not safely distinguishable from<br><i>thunbergi</i> / <i>plexa</i> ; on average slightly<br>cleaner grey head.  |  | Range 9.6–14.6<br>(mean 11.6, <i>n</i><br>= 13) |
| <i>taivana</i>                   | Diagnostic; forehead, crown and nape<br>dull greyish green concolorous with<br>upperparts, and supercilium yellow.<br>Darker ear-coverts, brownish black<br>or very dark greenish grey, always<br>darker than forehead, crown and nape. | Call as above but slightly<br>deeper in tone in latter part. | Range 9.6–13.6<br>(mean 11.0, <i>n</i><br>= 19) |

**Appendix 2.** GenBank accession numbers of wagtail DNA sequences used in this study. All sequences from Ödeen & Björklund (2003).

| Genbank no. | Subspecies of yellow wagtails |
|-------------|-------------------------------|
| Y259438.1   | <i>M. t. tschutschensis</i>   |
| AY259437.1  | <i>M. t. tschutschensis</i>   |
| AY259436.1  | <i>M. t. tschutschensis</i>   |
| AY259432.1  | <i>M. t. taivana</i>          |
| AY259431.1  | <i>M. t. taivana</i>          |
| AY259430.1  | <i>M. t. taivana</i>          |
| AY259423.1  | <i>M. t. macronyx</i>         |
| AY259411.1  | <i>M. f. flava</i>            |
| AY259422.1  | <i>M. f. lutea</i>            |
| AY259421.1  | <i>M. f. lutea</i>            |
| AY259417.1  | <i>M. f. iberiae</i>          |
| AY259414.1  | <i>M. f. flavissima</i>       |
| AY259407.1  | <i>M. f. feldegg</i>          |
| AY259403.1  | <i>M. f. feldegg</i>          |
| AY259398.1  | <i>M. f. beema</i>            |
| AY259435.1  | <i>M. f. thunbergi</i>        |
| AY259434.1  | <i>M. f. thunbergi</i>        |
| AY259433.1  | <i>M. f. thunbergi</i>        |
| AY259390.1  | <i>M. cinerea</i>             |

**Appendix 3.** All specimens catalogued as *Motacilla flava thunbergi* in the National Museum of Natural History, Colombo, Sri Lanka (information transcribed directly from the museum catalogue, 7 January 2020).

| Old registration no. | Sex | Collection date  | Locality    | How obtained          |
|----------------------|-----|------------------|-------------|-----------------------|
| 103                  | F   | 16 October 1918  | Puttalam    | Donated by W. E. Wait |
| 103A                 | M   | 16 October 1918  | Puttalam    | Donated by W. E. Wait |
| 103B                 | M   | 16 October 1918  | Puttalam    | Donated by W. E. Wait |
| 103C                 |     | -                | Colombo     | Royal Asiatic Society |
| 103D                 | M   | 4 March 1905     | Mannar      | Royal Asiatic Society |
| 103E                 | M   | 25 February 1918 | Weligatha   | Royal Asiatic Society |
| 103F                 | M   | 13 November 1953 | Thannianppu | Royal Asiatic Society |

| Old registration no. | Sex | Collection date   | Locality    | How obtained                |
|----------------------|-----|-------------------|-------------|-----------------------------|
| 103G                 | M   | 13 November 1953  | Thannianppu | Royal Asiatic Society       |
| 103H                 | M   | 6 January 1955    | Weddagala   | Royal Asiatic Society       |
| 103J                 | F   | 23 March 1955     | Mulatuiu    | Donated by 'Mrs Phillip'    |
| 103K                 | M   | 31 March 1957     | Ohiya       | Donated by 'Mrs Phillip'    |
| 103L                 | M   | 28 March 1957     | Pattipola   | Donated by 'Mrs Phillip'    |
| 103M                 | F   | 28 March 1957     | Pattipola   | Donated by 'Mrs Phillip'    |
| 103N                 | M   | 4 August 1939     | Walawa      | A. N. J de Sousa collection |
| 103O                 | F   | 14 September 1939 | Ohiya       | A. N. J de Sousa collection |
| 103P                 | M   | 10 August 1938    | Mulatire    | A. N. J de Sousa collection |
| 103Q                 | -   | -                 | -           | -                           |
| 103R                 | M   | 25 March 1975     | -           | -                           |