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► **To cite this version:**

Samara Danel, Gaël Bardon, Christophe de Franceschi, Léna Bureau, Christophe Barbraud, et al..
Plant consumer innovation in skuas. *Journal für Ornithologie = Journal of Ornithology*, 2023, 164
(3), pp.717-719. 10.1007/s10336-023-02061-z . hal-04031859

HAL Id: hal-04031859

<https://hal.science/hal-04031859>

Submitted on 19 Oct 2023

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1 ¹Plant consumer innovation in skuas

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13

14 **Abstract**

15 We report observations of alien dandelion (*Taraxacum officinale* group) consumption in an
16 opportunistic predatory seabird, the brown skua (*Stercorarius antarcticus lonnbergi*), from a natural
17 population on île Verte within the Kerguelen archipelago. Observations on a nearby island confirm that
18 this behaviour is not specific to our study area, paving the way to future studies investigating whether
19 this consumer innovation prevails in skua populations and results in dietary benefits in skuas.

20

21 **Keywords:** animal innovation; consumer innovation; field observation; novel food; *Stercorarius*
22 *antarcticus lonnbergi*.

23

24 **Statements and Declarations**

- 25 • **Competing Interests:** Authors declare no conflict of interest.

26

27 **Acknowledgments**

28 This work was financed by the French Polar Institute (IPEV): projects ETHOTAAF 354 (to FB) and
29 ORNITHOECO 109 (to CB), and was supported by grants from the Fyssen Foundation (to SD). This
30 study was approved by the French Ethical Committee (n° 201707131540776 of 22/07/2017), after
31 favourable recommendation of the Comité d'Ethique pour L'Expérimentation Animale Languedoc-
32 Roussillon (CEEALR), C2EA n°36, and by the Ethical Committee of the Réserve Naturelle des Terres
33 Australes et Antarctiques Françaises (decree n° 2019-130 du 28/10/2019). We declare that this work
34 complies with the current French laws.

35 A myriad of animal species have been reported to incorporate novel food types into their diet (Lefebvre
36 2020). This behaviour, known as consumer innovation, can be particularly useful in changing
37 environments where novel foods and foraging opportunities tend to arise (Prasher et al. 2019). Field
38 notes on previously unreported consumer innovation are crucial to understand how individuals cope
39 with changes in their environment, thereby potentially influencing a species' survival and evolution
40 (Sol et al. 2005). Here, we report for the first time the consumption of an alien plant, the common
41 dandelion (*Taraxacum* ssp.) in brown skuas (*Stercorarius antarcticus lonnbergi*) from two locations:
42 île Verte (although noticed since at least 2015: F. Bonadonna, pers. com) and île Mayès (although
43 noticed since at least 2002: C. Barbraud and K. Delord, pers. com), Morbihan Gulf, sub-Antarctic
44 Kerguelen archipelago (48°25'–50°00'S; 68°27'–70°35'E).

45 On 29 December 2019 (fieldwork duration: from 23 December 2019 to 16 January 2020; morning
46 session, between 8 – 11 a.m.), during the set-up of a cognitive object-choice task investigating brown
47 skuas' capacity to behave flexibly, the human experimenter noticed that an adult female from an
48 established breeding territory, 'Sourcil blanche', which was waiting in front of the apparatus, swallowed
49 the capitula (inflorescence's head) of a dandelion. At that time, skuas were being tested on a well-
50 established paradigm assessing behavioural flexibility: the reversal-learning task (e.g., Danel et al.
51 2022). The experimental device consisted of a portable horizontal white standard Foamex PVC foam
52 board (60 cm in length, 40 cm in width) fixed on each side to a vertical folding platform (16 cm in
53 height, 16 cm in length; Danel et al. work in preparation). The usual procedure was the following: two
54 containers were simultaneously presented on a mobile platform, with one of the containers covering a
55 food reward. The human experimenter, who was sitting on the ground behind the apparatus, manually
56 operated the apparatus by slightly pushing the platform away from or towards the test bird, which could
57 lift one container.

58 On 5 January 2019 (morning session, between 8 – 11 a.m.), during the disassembly of the
59 experimental device (i.e., after the trial), the experimenter observed again the swallowing of a
60 dandelion's capitula by another breeding individual ('18A', an adult male). The skua, first located
61 approximately 20 cm before the apparatus, turned its back and moved away from the device. At
62 approximately 80 cm from the apparatus, the skua stopped off, cut, and swallowed directly the capitula
63 of a dandelion.

64 The third observation occurred on 8 January 2019 (afternoon session, between 1 – 5 p.m.), before
65 the start of a trial, when the experimenter was unfolding the apparatus on the ground. The bird, a
66 breeding female ('21A'), was inspecting the ground approximately 2 m from the apparatus when it
67 suddenly removed the capitula of a dandelion, held it in the beak a few seconds, and ingested it.

68 Later on during the breeding season, on 16 January 2019 (morning session, between 8 – 11 a.m.), in
69 the non-experimental context (i.e., during usual nest prospection), another individual ('11A', an adult
70 female) exhibited this behaviour approximately 3 m from its nest.

71 Dandelion consumption has also been observed very recently on île Mayès, a nearby island within
72 the Morbihan Gulf, where skuas are more numerous and breed in higher densities (Quérroué et al. 2021;
73 **Figure 1**). On 29 October 2022, at approximately 8 a.m., a marked single skua was observed cutting
74 and eating dandelion flowers. Dandelion consumption occurred during annual monitoring of breeding
75 individuals (by binoculars), which suggests that this behaviour is not specific to our study area and/or
76 experimental context.

77 In conclusion, at least some brown skuas on île Verte and île Mayès are able to integrate into their
78 diet an alien plant, in line with their opportunistic feeding habits. This short note opens new avenues
79 for assessing further (i) the prevalence of this behaviour in skua populations and (ii) if dandelion
80 consumption provides specific advantages, such as nutrition or physiological benefits.

81

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98 **Figure captions**

99 **Fig. 1** Photograph of an adult brown skua (a) holding and (b) swallowing a cut dandelion flower in the
100 beak (île Mayès; © V. Autran)

