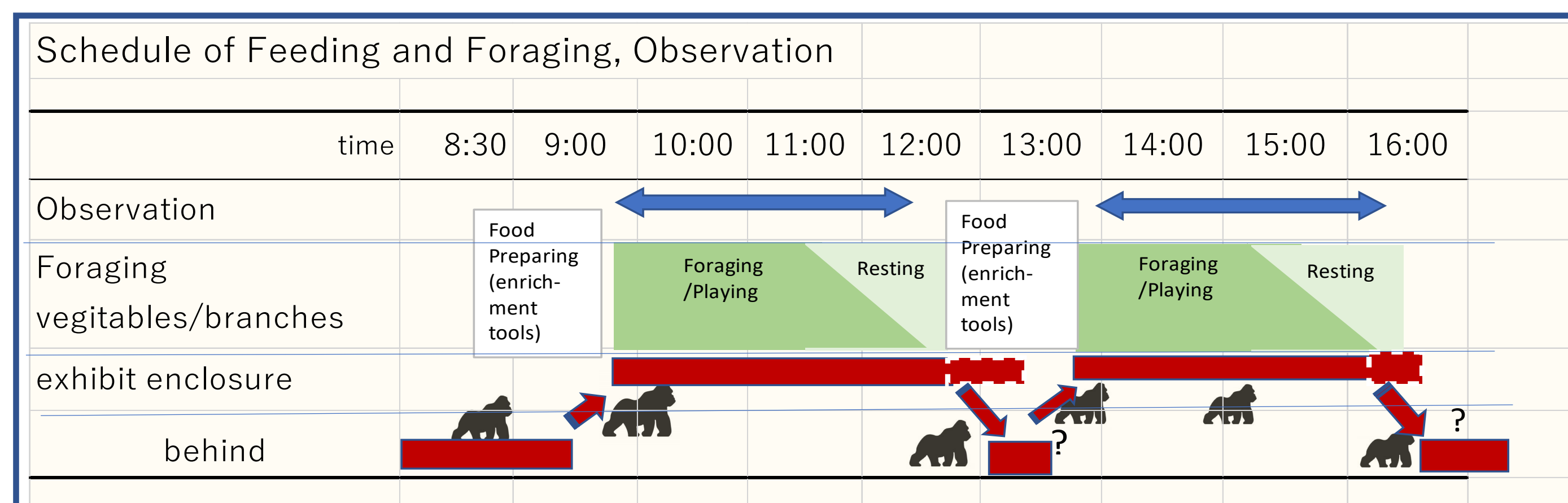
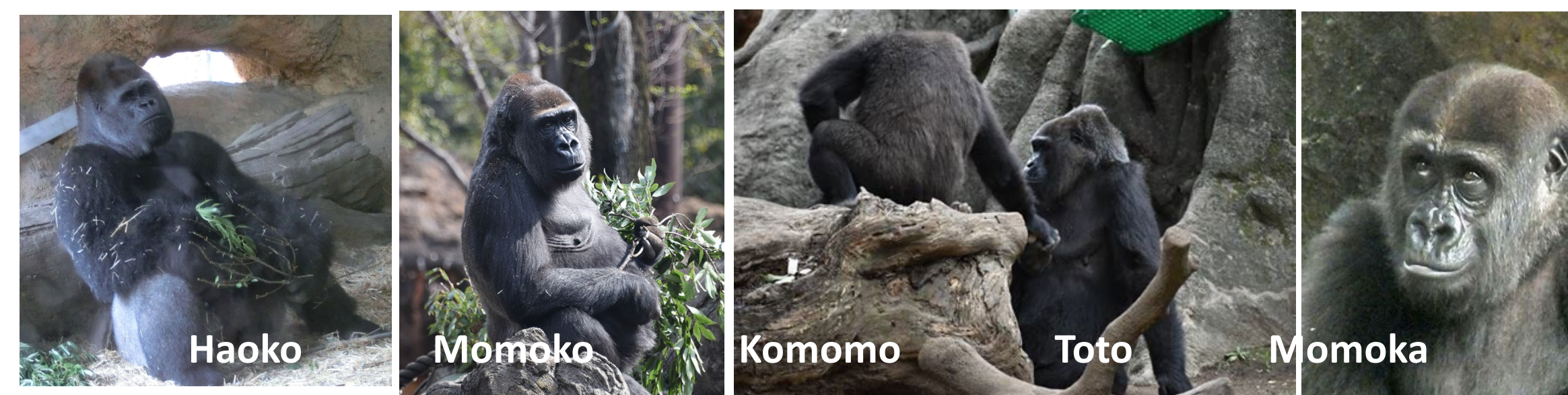


Significance of Feeding Branches to Captive Western Gorillas

Misako NAMIKI, Toyokazu KOBAYASHI
(Teikyo Univ. of Science)

It has been reported that many deaths were presumed to be caused by heart disease in middle-aged captive gorillas (Lyn and Raskin, 2007). From the perspective of health care, it is recommended to assess the antioxidant properties which have been shown to be effective in preventing humans' heart disease. In this study, we assessed it in branches gorillas foraged, related their holding duration of them, which supposed to be reflected their preference.

Subject and observation situation



Research question

- 1 Is there seasonal change of branches' antioxidant properties?
- 2 Is there relationship between Gorillas' preference and antioxidant properties?

Method

- 1 Measuring the antioxidative activities of all antioxidants contained in the samples, leaves and barks of each tree species, by BAP-test: reducing Fe³⁺ to Fe²⁺
- 2 Judgment of preference are based on holding and/or feeding duration by direct observation only at the enclosure, and the keepers' judgements.

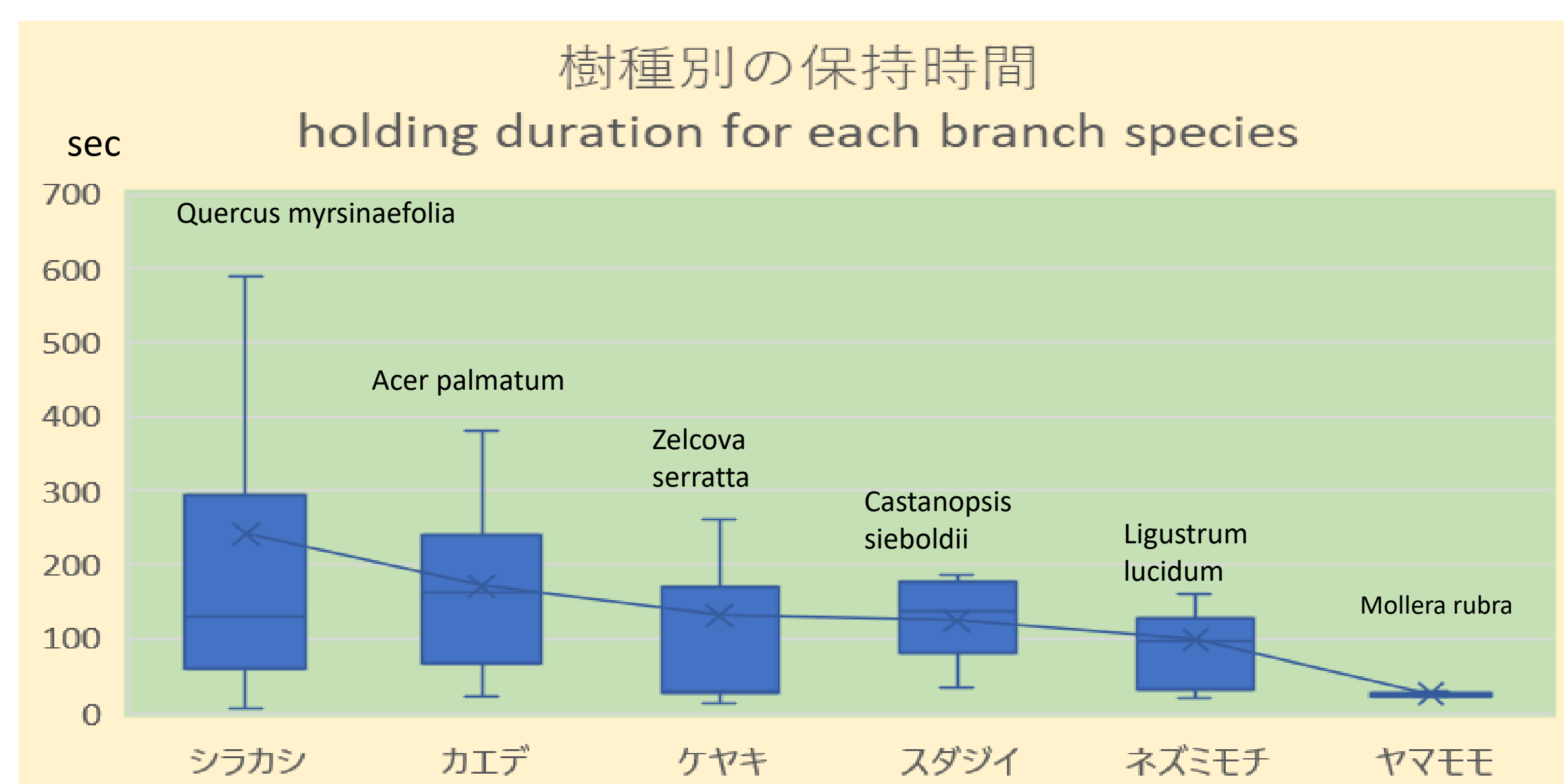
Result

Yearly feeding schedule and Gorillas' preference assessed by keepers

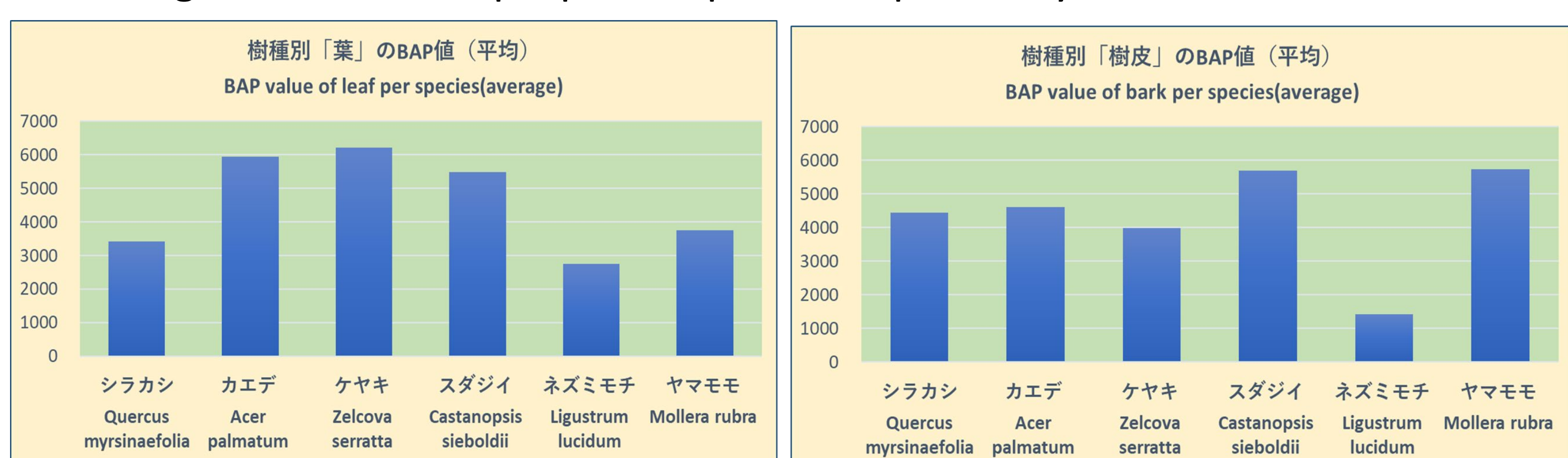
Tree species for feeding	Season											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Ever green	シラカン <i>Quercus myrsinifolia</i>					●			●		●	
	トウネズミモチ <i>Ligustrum lucidum</i>										●	●
	スダジイ <i>Castanopsis sieboldii</i>											●
	ヤマモモ <i>Morella rubra</i>								●			
Deciduous tree	ケヤキ <i>Zelkova serrata</i>					●	●		●			
	カエデ (オオモミ) <i>Acer palmatum</i>					●					●	
	コナラ <i>Quercus serrata</i>					○						

1月から2月は常緑樹のみ 3月から4月は落葉樹採食可能となる
Preference evaluation by gorillas' keepers (only June, July, Sep. Nov. and Dec. of 2017-18.)
● quite preference ○ preference

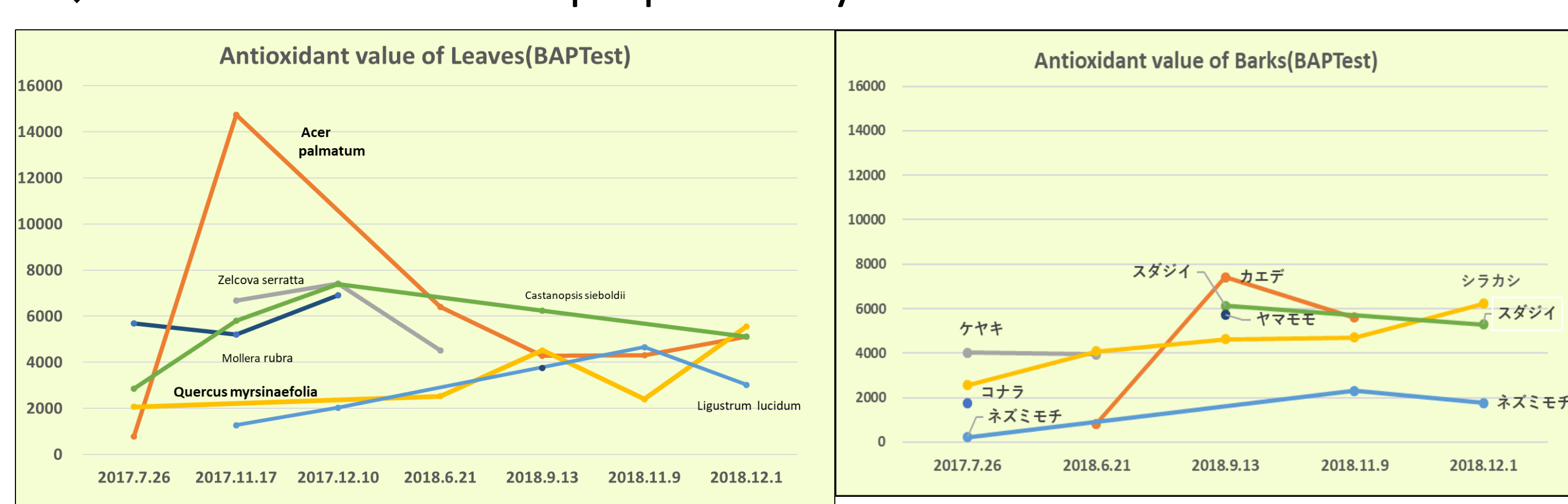
ほとんど毎日アクセス可能(Daily accessible)
アクセスできない場合がある (Not daily accessible)



Average antioxidative properties per tree species by BAP test



Seasonal antioxidative properties by BAP test



Research Q. A Seasonal change of branches' antioxidant properties

- 1 Maple leaves and bark have a tendency BAP values temporarily increase in the fall. Other species have no clear.
- 2 All other tree species, both leaves and bark, tended to be more antioxidant in the fall and winter than in the summer.
- 3 Changes in antioxidant properties were observed in the leaves than in the bark.

Research Q. B Relationship between Gorillas' preference and antioxidant properties

- 1 The holding duration of leaves and barks tended to be longer than that of the other diets.
- 2 The average holding duration of Oak and Zelkova, which are high level of antioxidant properties, tended to be longer than other tree species.

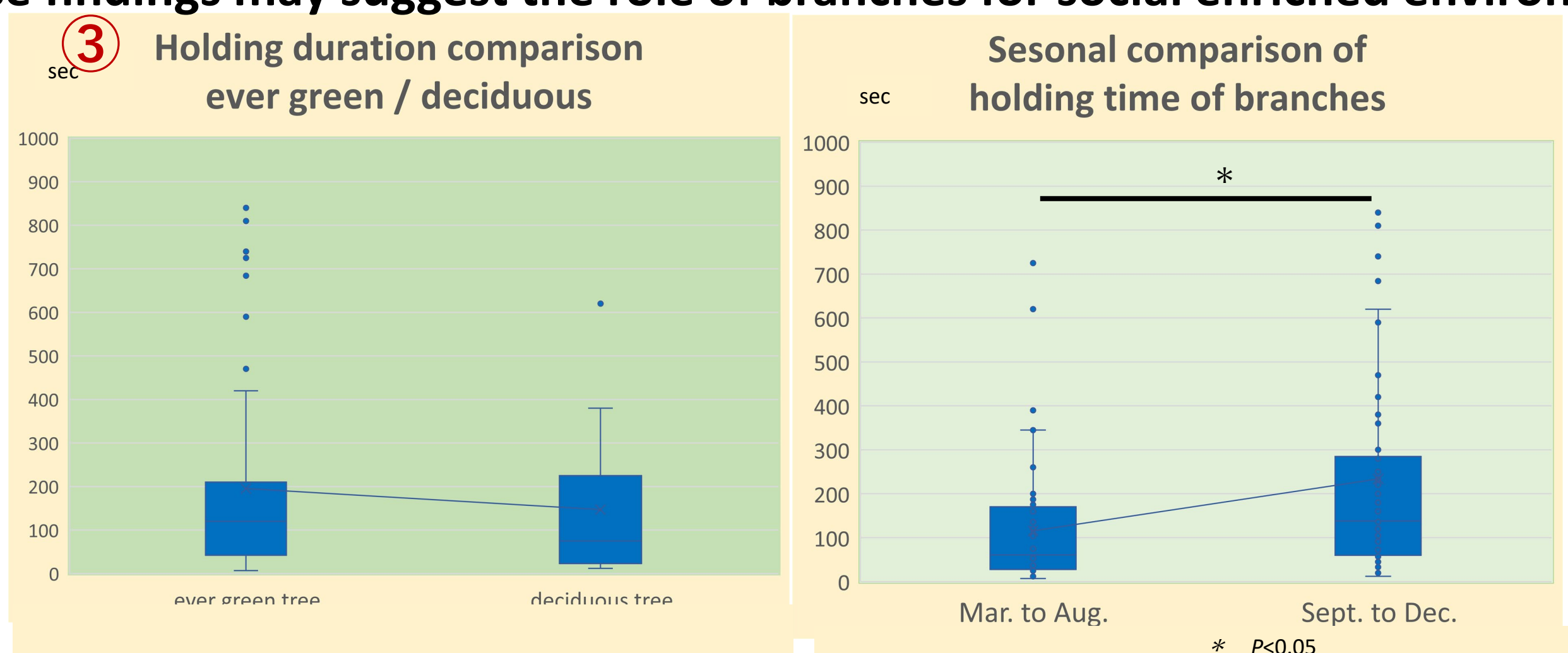
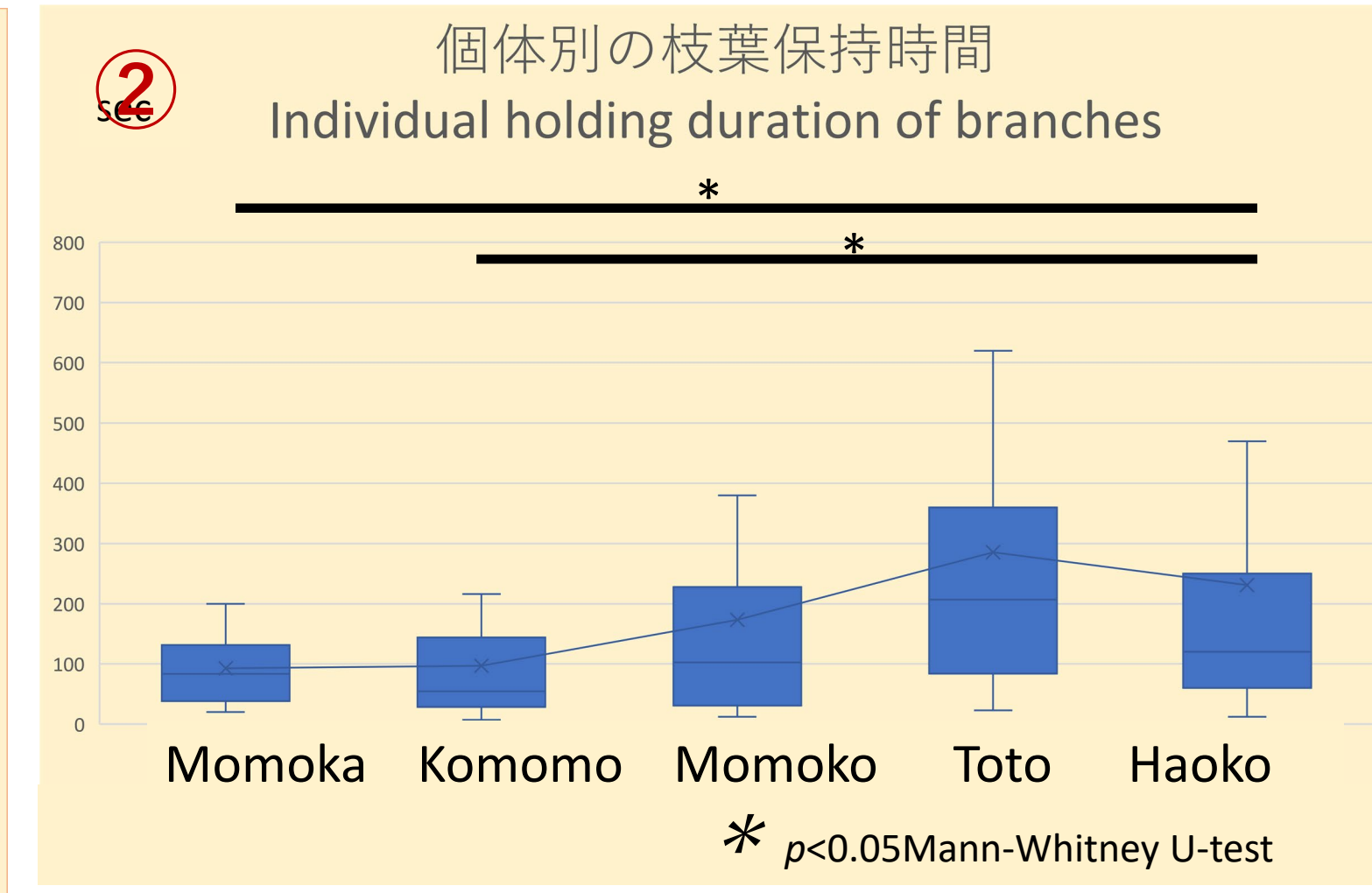
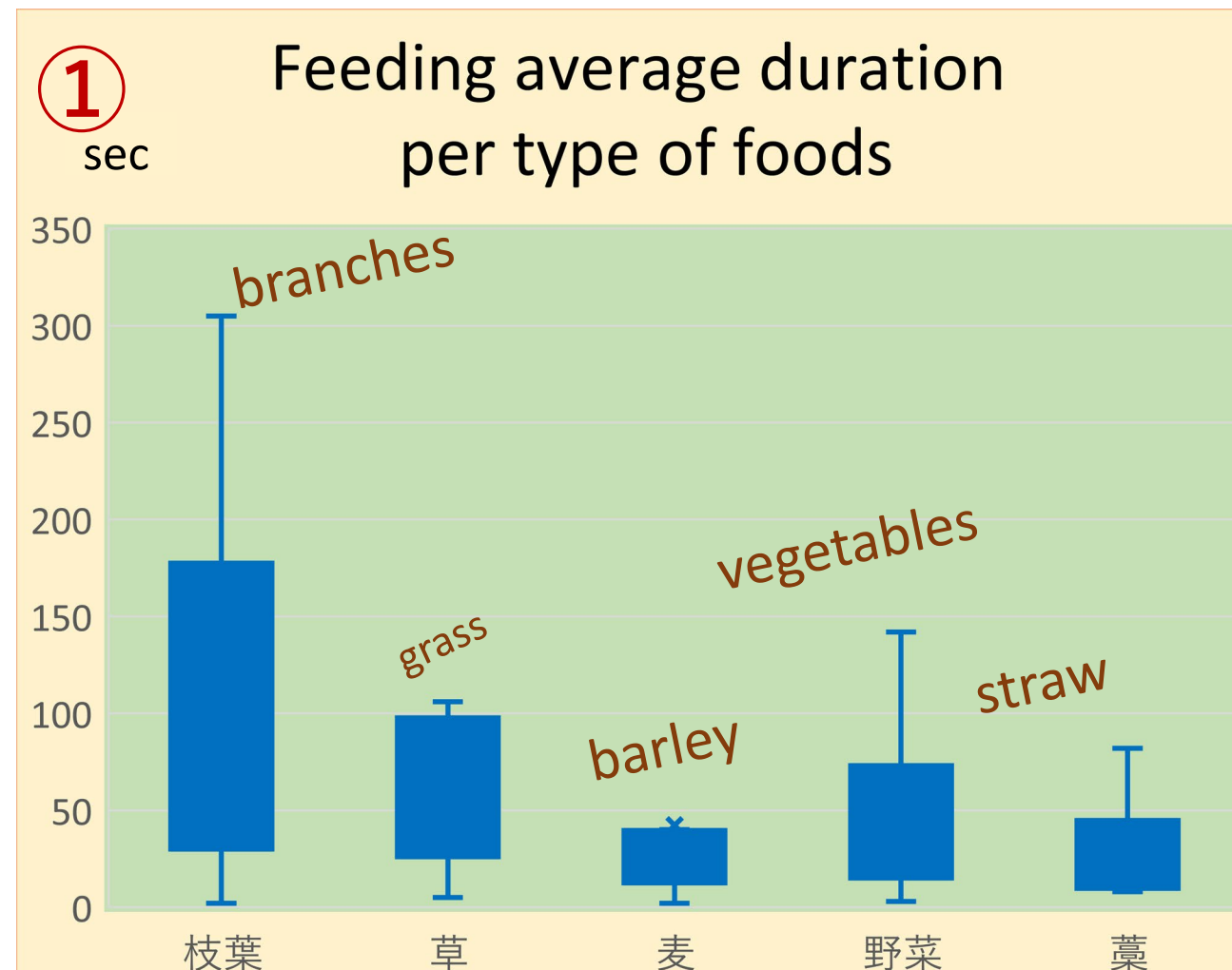
Discussion

- 1 From the creation of enriched environment, focusing to animals' preference may be useful, but it is necessary to assess the antioxidant property together with other nutrients contained in the leaves and bark trees, because it is thought that the antioxidant property changes as the nutritive value of the tree's ecology which depending on the defoliation time and the time to produce nuts.
- 2 Because we know nothing about the actual amount of feed intake for each of the individuals, quantitative analysis needs to be conducted in the future.

Other findings

- 1 The Holding duration of leaves and barks was longer than any other type of foods
- 2 The Holding duration of leaves and barks was significantly different between adult males and children.
- 3 The Holding duration was longer in deciduous trees than in evergreens and was significant longer in fall than summer
- 4 The elements of holding duration were to select, carry, smell, take an easy-to-eat posture, tear off, or eat leaves by directly applying the mouth to a branch, and to leave them, which sometime be used for dragging behavior.

→These findings may suggest the role of branches for social enriched environment.



Examples of eating/scratch marks 樹種別の食痕例
Peeling differences by species 樹種により剥がれやすさに差がある。
A few leaves are left 葉には少し食べ残しがみられる。

Comparison of holding duration of branches by all gorillas

Significant seasonal differences, No significant differences between evergreen/ deciduous 全個体による枝葉の保持時間は、常緑樹/落葉樹間で差はないが、季節 (3-8月/9-12月) により有意差がみられた。

Acknowledgement

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