

# The Carrot genome



Presented by :  
**Fatima Habib Haidar**  
Intro to genomics ( 485 )  
Spring 2020

# Outline

- Genome paper.
- Fun facts about carrots .
- General information about carrots .
- Sequencing strategy .
- Sequencing methods .
- Assembly.
- Annotation.
- Questions.



nature  
genetics

OPEN

---

## A high-quality carrot genome assembly provides new insights into carotenoid accumulation and asterid genome evolution

Massimo Iorizzo<sup>1,12</sup>, Shelby Ellison<sup>1</sup>, Douglas Senalik<sup>1,2</sup>, Peng Zeng<sup>3</sup>, Pimchanok Satapoomin<sup>1</sup>, Jiaying Huang<sup>3</sup>, Megan Bowman<sup>4</sup>, Marina Iovene<sup>5</sup>, Walter Sanseverino<sup>6</sup>, Pablo Cavagnaro<sup>7,8</sup>, Mehtap Yildiz<sup>9</sup>, Alicja Macko-Podgórní<sup>10</sup>, Emilia Moranska<sup>10</sup>, Ewa Grzebelus<sup>10</sup>, Dariusz Grzebelus<sup>10</sup>, Hamid Ashrafi<sup>11,12</sup>, Zhijun Zheng<sup>3</sup>, Shifeng Cheng<sup>3</sup>, David Spooner<sup>1,2</sup>, Allen Van Deynze<sup>11</sup> & Philipp Simon<sup>1,2</sup>



# Fun facts

- We think of carrots as orange, but they can also be white , yellow , red and purple .
- The orange pigmentation result from the high quantities of alpha - beta carotene making carrots the richest source of vitamin A in our systems.
- Carrots are made up of 88% of water .



# Fun facts

- Cooking carrots is better for you than eating raw carrots .
- carrots contain four types of sugars ( sucrose, glucose, xylose and fructose ) .
- Carrots are good source of fiber .
- Carrots have many medical properties .





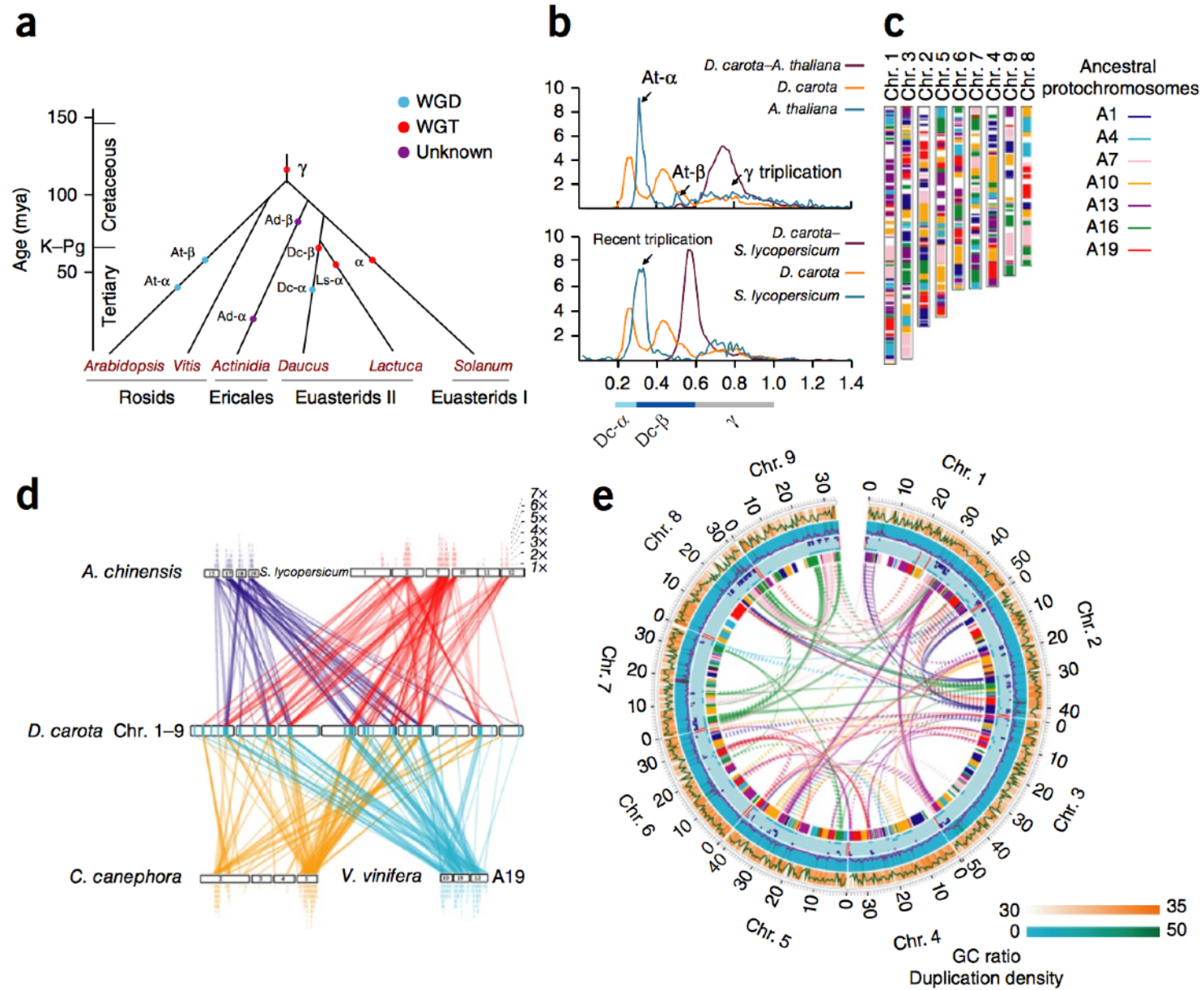
# General information about carrots

- Common name : carrot .
- Scientific name : ***Daucus carota*** .
- The carrot is a diploid species , and has 9 relatively short chromosome (  $2n=18$  ) .



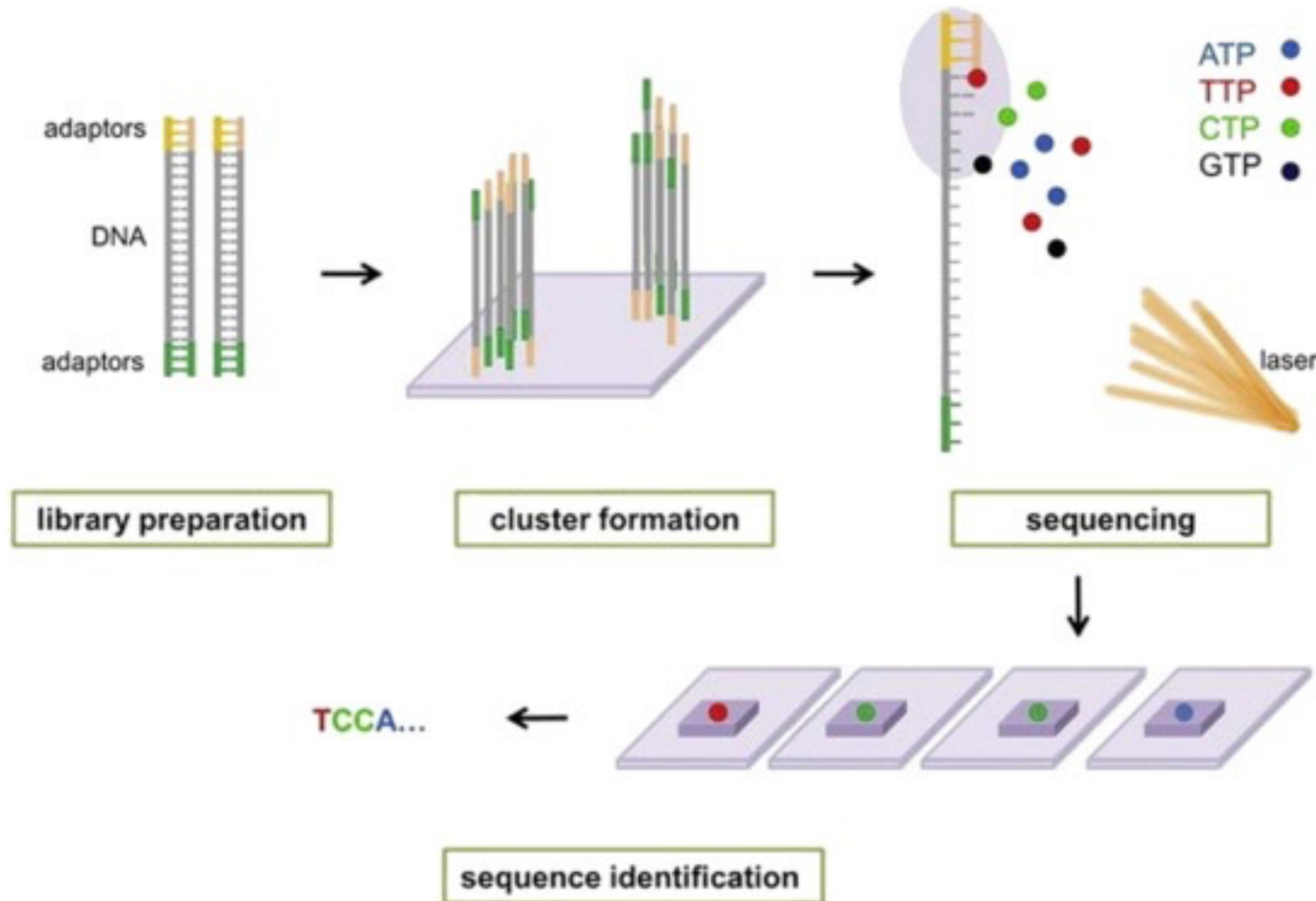
# Sequencing strategy

- WGD : Whole genome duplication .



# sequencing methods

- Illumina .





# Assembly

- **Assembly sequencing** : diploid genome .
- **Genome size** : 473 Mb
- **N50 contigs**: 12.7 Mb
- **N50 scaftigs** : 31.2 Mb
- **Scaffolds N50** : 64.5 Kb
- **GC content** : 34%



# Genome annotation

## Genome annotation

Total repetitive sequence		193.7 Mb
Gene models	32,113	108.2 Mb
Genes in pseudomolecules	30,824 (96.0%)	
Noncoding RNAs	1,386	188.9 kb

---





# questions

- 1- How many type of sugar that carrots contain ?
  - 4 types ( sucrose, glucose, xylose and fructose ).
- 2- What are the scientific name of the carrots ?
  - ***Daucus carota*** .





# Thank you

